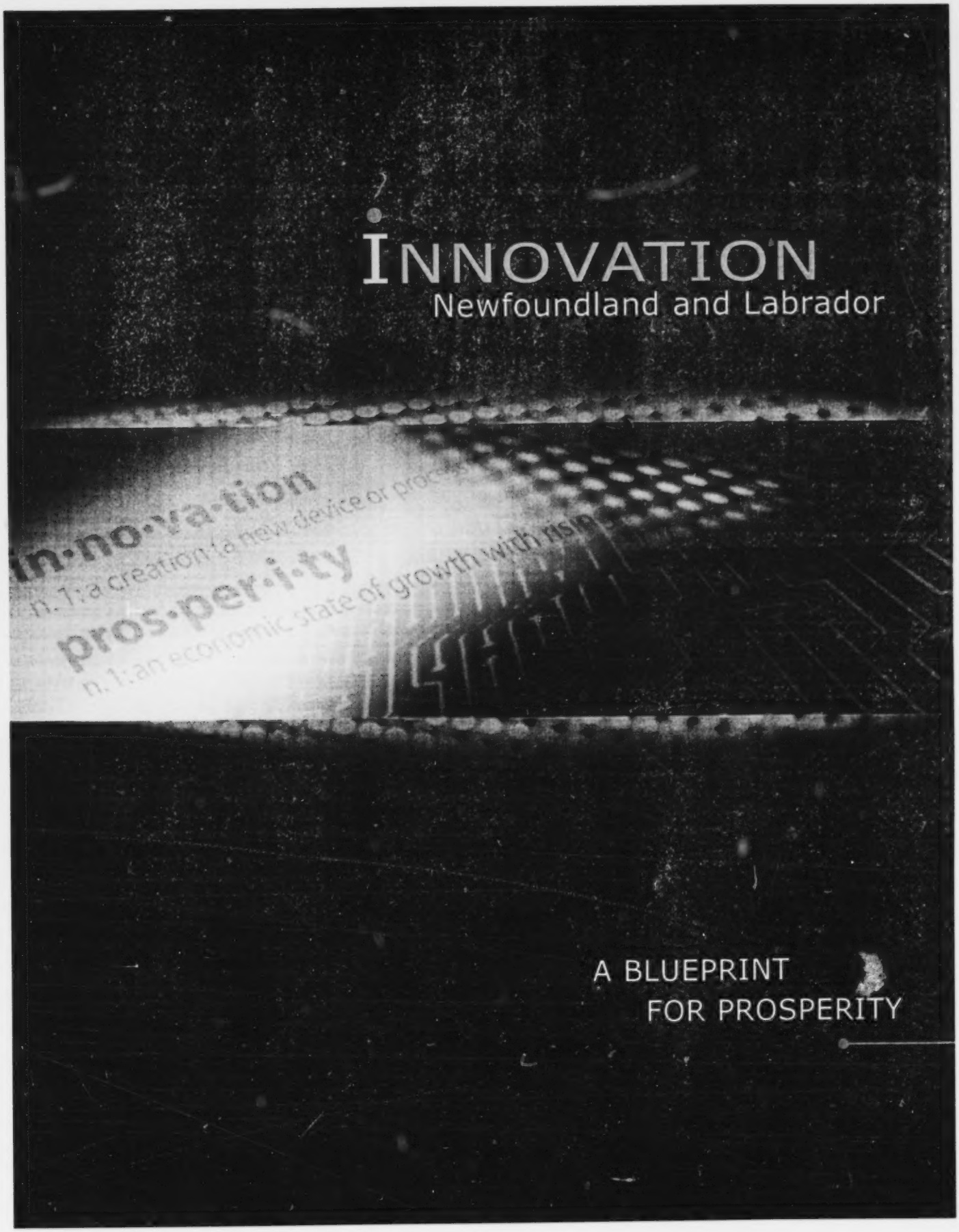

INNOVATION
Newfoundland and Labrador
pros·per·i·ty
n. 1: an economic state of growth with
A BLUEPRINT
FOR PROSPERITY

CONTENT

Foreword			2
	Message from the Premier		2
	Message from the Minister		3
Executive Summary			4
1.		**Purpose**	9
1.1		What is Innovation?	10
1.2		Why is Innovation Necessary?	11
1.3		What is an Innovation Strategy?	12
1.4		An Innovation Strategy for Newfoundland and Labrador	12
	1.4.1	The Federal Government Initiative	13
	1.4.2	Consultations and Research	14
	1.4.3	A Partnership Approach	15
2.		**Our Innovation Status**	17
2.1		What Makes Economies Innovative?	18
2.2		Our Innovation Assets	19
	2.2.1	Research and Development	19
	2.2.2	Education	22
	2.2.3	Business Environment	24
2.3		Our Innovation Challenges	29
	2.3.1	Research and Development	30
	2.3.2	Education	31
	2.3.3	Business Environment	32
2.4		Using Assets, Addressing Challenges	34
3.		**Government's Model for Innovation**	35
3.1		Our Vision	36
3.2		Fundamentals of Innovation	37
	3.2.1	A Culture of Innovation	37
	3.2.2	Skills and Knowledge	37
	3.2.3	Industry Structure	38
	3.2.4	Financial Supports	39
	3.2.5	Regulation and Policy	39
	3.2.6	Infrastructure	39
	3.2.7	Market Opportunities	40
	3.2.8	Working Together	40
3.3		Our Innovation System	41
4.		**Government's Innovation Strategy**	43
4.1		Four Strategic Directions	44
4.2		Fostering a Culture of Innovation	45
4.3		Building a More Competitive Newfoundland and Labrador	46
4.4		Strengthening Education and Skills Development	47
4.5		Supporting and Expanding R&D and Commercialization	48
5.		**Implementing the Strategy**	51
5.1		Actions at Work	52
5.2		New Actions	54
	5.2.1	Supporting Commercialization	54
	5.2.2	Enhancing Innovation	55
6.		**Tracking our Progress**	57
6.1		Accountability Framework	58
6.2		Macro-level Indicators	58
	6.2.1	Investment	58
	6.2.2	Knowledge Base	59
	6.2.3	Productivity and Competitiveness	60
	6.2.4	Other Innovation Capacity Measures	61
7.		**From Innovation Strategy to Innovation System**	63
Appendix		Current Initiatives	67
		Acronyms	74

CONTENT

Foreword			2
		Message from the Premier	2
		Message from the Minister	3
Executive Summary			4
1.		**Purpose**	9
1.1		What is Innovation?	10
1.2		Why is Innovation Necessary?	11
1.3		What is an Innovation Strategy?	12
1.4		An Innovation Strategy for Newfoundland and Labrador	12
	1.4.1	The Federal Government Initiative	13
	1.4.2	Consultations and Research	14
	1.4.3	A Partnership Approach	15
2.		**Our Innovation Status**	17
2.1		What Makes Economies Innovative?	18
2.2		Our Innovation Assets	19
	2.2.1	Research and Development	19
	2.2.2	Education	22
	2.2.3	Business Environment	24
2.3		Our Innovation Challenges	29
	2.3.1	Research and Development	30
	2.3.2	Education	31
	2.3.3	Business Environment	32
2.4		Using Assets, Addressing Challenges	34
3.		**Government's Model for Innovation**	35
3.1		Our Vision	36
3.2		Fundamentals of Innovation	37
	3.2.1	A Culture of Innovation	37
	3.2.2	Skills and Knowledge	37
	3.2.3	Industry Structure	38
	3.2.4	Financial Supports	39
	3.2.5	Regulation and Policy	39
	3.2.6	Infrastructure	39
	3.2.7	Market Opportunities	40
	3.2.8	Working Together	40
3.3		Our Innovation System	41
4.		**Government's Innovation Strategy**	43
4.1		Four Strategic Directions	44
4.2		Fostering a Culture of Innovation	45
4.3		Building a More Competitive Newfoundland and Labrador	46
4.4		Strengthening Education and Skills Development	47
4.5		Supporting and Expanding R&D and Commercialization	48
5.		**Implementing the Strategy**	51
5.1		Actions at Work	52
5.2		New Actions	54
	5.2.1	Supporting Commercialization	54
	5.2.2	Enhancing Innovation	55
6.		**Measuring our Progress**	57
6.1		Accountability Framework	58
6.2		Macro-level Indicators	58
	6.2.1	Investment	58
	6.2.2	Knowledge Base	59
	6.2.3	Productivity and Competitiveness	60
	6.2.4	Other Innovation Capacity Measures	61
7.		**From Innovation Strategy to Innovation System**	63
Appendix		Current Initiatives	67
		Acronyms	74

FOREWORD

Message from the Premier

The Government of Newfoundland and Labrador is committed to building a sustainable, diversified economy in which people and communities throughout the province can prosper and thrive. To achieve this, government committed in the 2004 Speech from the Throne to an economic growth and recovery agenda tied to an innovation strategy.

Over the past two years our government has made substantial investments in Newfoundland and Labrador to diversify the economy, and we have developed strategies to grow new sectors of the economy. But to successfully grow our economy requires a collective effort by many groups including labour, industry, educators, entrepreneurs, research institutions, economic development groups, government and non-governmental organizations, all working toward a common goal. This Innovation Strategy is designed to help achieve our collective objectives.

We have made impressive gains in important emerging areas of the economy including oil and gas, information technology, and ocean technology. Our achievements have been great, and we must focus on further growth and developing new opportunities. We must continue to generate new ideas and commercialize them, and continue to export our goods and services against strong competitors in global markets. We must also focus greater attention on attracting investment to our province. Increasing research and development in the private and public sectors will also contribute to developing new businesses and fostering economic growth, particularly in rural Newfoundland and Labrador.

There must be a commitment to making better use of all our resources, whether they be raw materials from the land and sea or, more especially, our people. This is not a job for government alone; it is a job for every one of us. We need to strengthen our culture of innovation; a culture where every individual learns to develop innovative solutions to the challenges we face. As a people, we have faced and overcome challenges for hundreds of years. We need to extend that ability, whether it is a town council trying to attract industry, a rural business person trying to offer a new service, or the head of a high tech company selling into global markets.

This Innovation Strategy represents our vision for Newfoundland and Labrador's future in the 21st century, and I encourage you to embrace it and participate in making this province a better place.

Honourable Danny Williams
Premier of Newfoundland and Labrador

Message from the Minister

As Minister of Innovation, Trade and Rural Development, I am pleased to present this Innovation Strategy for Newfoundland and Labrador. Our province and our people have a long history of innovation and resourcefulness. In the earliest times it was necessary to adapt to our harsh environment and to innovate to stay alive and prosper. Today, innovation is just as important for our economic survival and growth.

The world runs on trade. The wealthiest countries are those that best use their natural resources and talents to trade with other countries. Newfoundland and Labrador has a wealth of resources. One of the most important is our innovative and hardy population, but we need to use all our resources better. We cannot simply sell our raw materials to the highest bidder, as we used to with our fish, lumber and ore. We have to find innovative ways to add value to what we do. We need to find ways to use the resources of our oceans and lands more profitably and make a better living for ourselves.

Innovation is not something done only by scientists and engineers. Innovation is the creation, sharing and implementation of new ideas resulting in economic value or social gain. It may be developing a new, high-tech piece of navigational equipment or computer systems, but it is also about finding better ways to provide daycare so that people can work comfortably knowing their children are safe. Successful innovation can, and should, reach into all aspects of our lives.

To achieve this kind of success, we must build a more competitive Newfoundland and Labrador, strengthen education and skills development, and support and expand research and development and commercialization. Ours will be a culture of innovation that values and promotes the creation, sharing and implementation of new ideas throughout all our industries and institutions and among all our people.

My department will lead the implementation of the Innovation Strategy, but it will require the active involvement and support of all departments and agencies to work. It also needs the participation and commitment of all Newfoundlanders and Labradorians. As a team, we can succeed.

This Strategy will require the effort, participation and feedback of many people sharing ideas and developing new solutions. I encourage you to read it and imagine how you can play a part. If, after reading this document, you have thoughts you would like to share with us, I invite you to submit them to my department. I encourage you to become part of the solution.

Honourable Kathy Dunderdale
Minister of Innovation, Trade and Rural Development

EXECUTIVE Summary

We envision an innovative Newfoundland and Labrador that fosters and sustains a culture of creative thinking. We will work cooperatively to achieve economic and social gain and create an economy that is ready to compete globally so that our people live in, and contribute to, a more prosperous Newfoundland and Labrador.

Newfoundland and Labrador's Innovation Strategy is a plan to increase our capacity for innovation so that we can compete more successfully in the changing global marketplace, and grow and prosper as an economy and a society. This Strategy:

- identifies specific initiatives in key areas that will stimulate, support and capitalize on innovation;
- establishes goals and objectives to support these strategies; and
- formulates actions to achieve these goals.

In doing so, it also builds on the many existing initiatives that are essential to support and complement our Strategy, and places them within government's overall innovation agenda.

Our challenge in preparing this Strategy was to find the right mix of support, facilitation, partnerships and strategic interventions for our unique needs and circumstances. Consequently, it was developed based on substantial research, considerable expert opinion, a careful consideration of our strengths and our challenges, and, most important of all, the advice and direction of many stakeholders across the province who participated in our consultation process.

Innovation is the creation, sharing and implementation of new ideas resulting in economic value and social gain. It is not just about new things for their own sake. It is about creative concepts, products and solutions that lead to results, and results that lead to increased prosperity and an improved quality of life. This does not diminish the importance of research and creativity that are not applied directly to some problem or do not immediately result in a product or service that makes a profit. While we recognize that curiosity-driven research is often necessary for innovation, the Strategy

also supports the means and the capacity of turning such research into prototypes, and eventually into products and services destined for markets around the world.

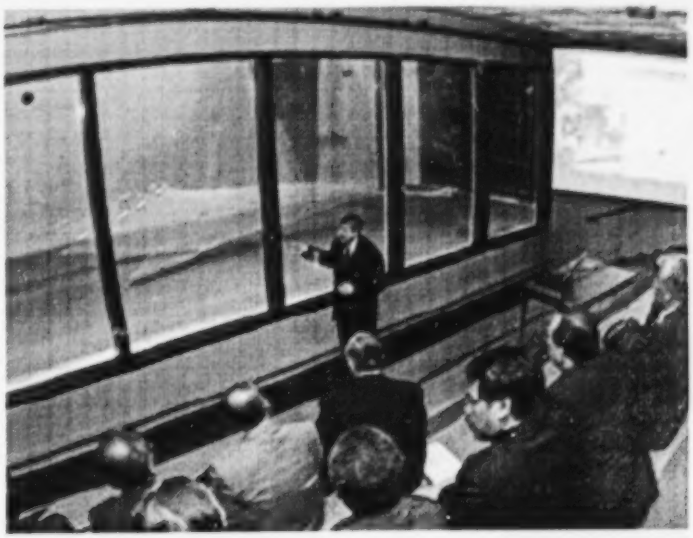
In the past 50 years, Newfoundland and Labrador's society, culture and economy have undergone tremendous change. This has included changes in our resource base, our industries, the structure of our communities, our communications and transportation systems, our education system and the make-up of our population.

These changes and past opportunities have resulted in the development of many assets that we can build on for the future. These assets include a strong research and development (R&D) sector in certain areas, such as ocean technology expertise for which we are known around the world, excellent and comprehensive education and training systems, good supports for industries and businesses, effective initiatives to foster and support our regions, and a solid infrastructure base in many areas.

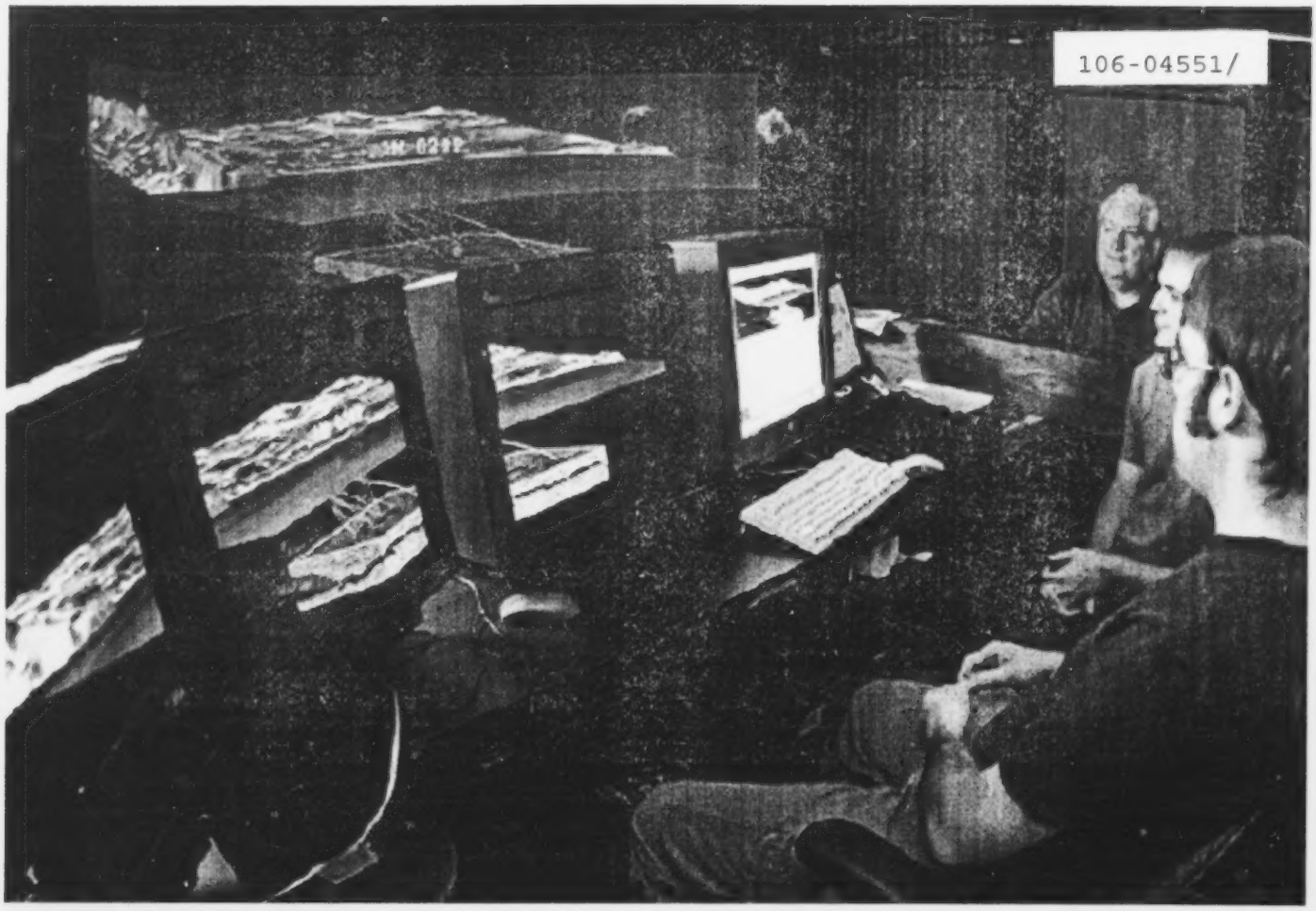
Changes here and in other parts of the world in which we compete have also created many challenges which this Strategy works to address. Studies have indicated that Newfoundland and Labrador's innovation performance is not keeping up with the rest of Canada and some other regions of the world where innovation economies have been changing the global economic landscape.

Several factors contribute to this situation, including a relatively low level of investment in R&D by the private sector; limited resources at our university, college and other institutions to carry out R&D activities for the private sector; limited access to private-sector risk capital and financing for commercialization; insufficient knowledge-based infrastructure, particularly in rural areas; the perception of inflexible government or bureaucratic structures; out-migration of knowledge-industry and other skilled workers; our small population and our geography, and the challenges these create for developing capacity and reaching clients and markets.

To compete and succeed in the global marketplace we have to meet these challenges. This means ensuring that we have the fundamental elements required to build and sustain an effective, innovation economy. We need to foster an awareness in our culture of the value of new ideas and a confidence in our ability to take risks and succeed. We also need the right financial supports and the right regulations and policies to increase our capacity for innovation. We need to have the right physical and information infrastructure to serve as a foundation for innovators. We need competitive industry structures that take advantage of our present strengths and encourage us to develop new ones. We need to be able to identify and capture market opportunities for our innovative goods and services. We must ensure that our people have the right skills and knowledge to support an innovation economy. And, finally, we must find new and better ways to cooperate and collaborate so that we can work together to compete successfully in the global marketplace.



These elements are the building blocks of a successful innovation system, the complex set of relationships among people, organizations, institutions and enterprises that drives successful innovation. How well we develop and use them will determine our overall innovation performance.



Government has identified four strategic directions to focus the provincial Innovation Strategy as it builds and strengthens the innovation fundamentals required for a strong innovation economy:

- Fostering a culture of innovation that encourages new ideas and collaboration among industry, labour, government, educational institutions and other stakeholders throughout the province;
- Positioning Newfoundland and Labrador as a competitive economy with recognized international strengths and advantages;
- Broadening education and skills development, and aligning them with the future economic direction and labour market development needs of the province; and
- Supporting enhanced R&D capacity, and improving financing and investment tools to facilitate commercialization.

Government has been building the groundwork for its Innovation Strategy over the past two years. The importance of innovation for our economy was recognized in *Our Blueprint for the Future* (the Blue Book) in 2003, and several important actions have already been taken to provide a foundation for our new actions to move this agenda forward. The Innovation Strategy now brings a broader vision and a new framework for integrating these initiatives, ensuring that they work more effectively together and with other actions to build a strong and vibrant innovation system.

The restructuring and refocusing of the lead department for the Innovation Strategy has been particularly important. In February 2004, government's economic development department was renamed the Department of Innovation, Trade and Rural Development (INTRD) to reflect the enhanced emphasis placed on innovation in the provincial economic agenda. A new Assistant Deputy Minister, who also serves as the province's Chief Innovation Officer, was appointed to head up a new Innovation, Research and Advanced Technologies Branch. A priority for this Branch has been to lead the development of this Strategy, and now it will lead its implementation.

Achieving the strategic directions will also be accomplished by specific new actions that support commercialization and enhance innovation. The following are new initiatives under this Strategy.

Supporting Commercialization

Government will create a new Commercialization Program to support product and services commercialization. A new fund will expand the range of funding options for small and medium-sized enterprises (SMEs) and increase the profitability of transforming a new idea into a new commercial product.

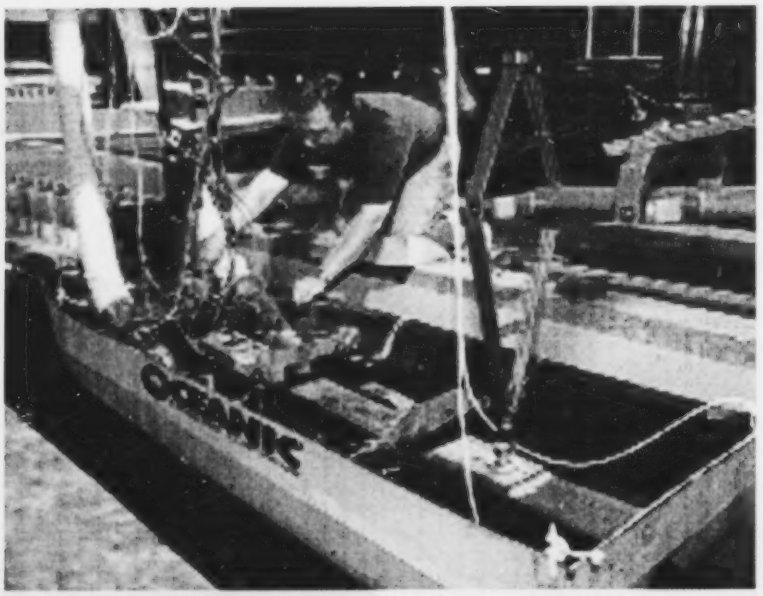
In addition to general commercialization support, which will represent the primary use of funds within this program, specific initiatives have also been identified, in areas such as protection of intellectual property (IP) and technology transfer support.

Enhancing Innovation

Government will create a new Innovation Enhancement Fund to provide support for public-sector institutions, not-for-profit groups, community organizations and industry associations involved in activities that will enhance the innovation capacity of the province. Through this program, government will:

- support the development of strategic clusters;
- create an innovation awards program;
- form a Federal-Provincial Innovation Team;
- support youth innovation;
- establish an innovation scholarship fund;
- enhance graduate employment opportunities;
- inform the business community on R&D incentives; and
- establish an Advisory Council on Innovation.

To monitor implementation of the Strategy, we will measure our progress on two fronts. The first consists of an accountability framework to track and report the activities and impacts of the major initiatives and funding programs that are part of this Strategy. This framework will act as a tool for enhancing governance, planning, monitoring and reporting, and will encourage evidence-based decision making, reiterating government's commitment to public transparency and accountability.



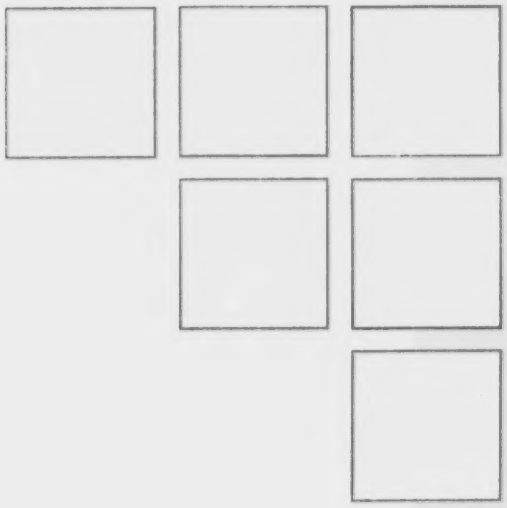
The second front will track the performance of a number of macro-level indicators that both reflect and impact on our innovation capacity. These indicators identify objectively our strengths and challenges, and provide benchmarks by which differences and changes can be observed over time. These measures will thus allow an analysis of the change in the province's innovation capacity over the long term. The chosen indicators fall into four broad categories: investment, knowledge base, productivity/ competitiveness, and other innovation capacity measures. Together, they consider a broad view of Newfoundland and Labrador's innovative capacity and innovation-related activities.

The new and current initiatives described in this Strategy are the starting points for creating a truly innovative culture and economy, and building a more prosperous society. Fully implementing our Strategy - and achieving our vision - will take time. It will be an evolving and dynamic process in which government and stakeholders continue to seek the most effective approaches, matched with the necessary resources to achieve our goals.

It is essential that all of our partners, stakeholders and citizens are committed and willing to participate so that we can improve our innovation performance. Working together we can meet the challenge and build the vibrant and dynamic innovation system we need to sustain our province and grow our future opportunities. Together, we will achieve our vision of a culture and economy that fosters and sustains innovative thinking and works cooperatively to achieve its goals of economic and social gain, where people will be better prepared and supported to compete globally so that they may live in, and contribute to, a more prosperous Newfoundland and Labrador.

Newfoundland and Labrador
INNOVATION STRATEGY

Purpose



1.1. What is Innovation?

Innovation is about change. It is about new ideas, learning to do things differently, and dealing with familiar situations in new ways. In the past 50 years, Newfoundland and Labrador's society, culture and economy have undergone tremendous change. This has included changes in our resource base, the structure of our communities, our communications and transportation systems, our education system and the make-up of our population. Our people have higher expectations and, in many ways, are better off than ever before. There are more demands on our resources, and we need to find new and better ways of meeting these demands.

Innovation helps us cope with change, and it allows us to use change to our advantage. Innovation can also initiate change, allowing us to fix a situation that is not working very well, or to create new opportunities where there were none before. It can help us to diversify our economic base so we become less dependent on any one resource or any particular market.

Newfoundland and Labrador's Blueprint for Sustainable Economic Growth Through Innovation, defines innovation as "the creation, sharing and implementation of new ideas resulting in economic value and/or social gain."

Innovation can occur almost anywhere, not just in research labs, large corporations and universities. While these are very important sources of innovation, it is also driven by small businesses looking for more economical ways to make products or to get products to market, by artists and designers exploring new concepts or materials, and by communities seeking ways to use their resources more efficiently and effectively, or to attract new industries.

Government's discussion paper, Newfoundland and Labrador's Blueprint for Sustainable Economic Growth Through Innovation, defines innovation as "the creation, sharing and implementation of new ideas resulting in economic value and/or social gain." Similarly, Canada's innovation strategy, Achieving Excellence (2002), describes it as "the process through which new economic and social benefits are extracted from knowledge. ... Through innovation, knowledge is applied to the development of new products and services or to new ways of designing, producing or marketing an existing product or service for public and private markets." In the context of economic development, the United Nations Conference on Trade and Development (UNCTD) Secretariat observes that innovation applies not only to radical technological innovations on the frontiers of technology, but also to "the continuous and incremental changes

that are carried out by enterprises themselves in the course of organizing investment, creating production capacity, building and upgrading technological capabilities and generally learning to cope with changes. In this sense, innovation is defined as 'the processes by which firms master and implement the design and production of goods and services that are new to them, irrespective of whether or not they are new to their competitors - domestic or foreign' " *(The Changing Nature of Enterprises and Competition and the Implications for the Formulation of an Enterprise Development Strategy*, UNCTD Secretariat Issues Paper GE.96-52076, 1997).

In all of these definitions, one thing is clear: innovation is not just about change for its own sake. It is about change that leads to results, and results that lead to increased prosperity and an improved quality of life. As a vehicle for social and economic growth, innovation must also be applied so that we benefit as a society because of these changes.

This definition of innovation does not diminish the importance of research and creativity that are not applied directly to some problem or do not immediately result in a product or service that makes a profit. Primary or curiosity-driven research feeds the cycle of innovation. This Strategy supports all the stages of that cycle: conducting primary research, turning research into prototypes, and eventually creating products and services for the world's markets.

To be innovative as an individual is to be creative and practical; to be innovative as a society or culture is to recognize the value of innovation, to encourage and support it, and to be open to embrace new ideas and the opportunities they bring.

1.2. Why is Innovation Necessary?

Change is a fact of life. Newfoundlanders and Labradorians share a strong legacy of adapting to change and meeting challenges, and of ingenuity and resilience under difficult and varying circumstances over many generations. However, change and innovation are now occurring globally at an accelerated pace. As much as we have changed, the global economy is changing even more rapidly. Global markets that where once beyond our reach are now only a high-speed internet connection away. New products and services are being created in areas of the world that used to be followers rather than leaders. Increasingly, they are setting new standards for doing business and succeeding in the global marketplace.

To compete in that marketplace - even just to keep the position we have occupied in the past - we have to stay abreast of global change. To move forward - which is our aim - we have to do even more. We have to be proactive about change, not just reactive. We have to be innovative in our planning, as well as in our products and services.

Economic benefits are not the only advantages that come with innovation. Advanced education and research in a society bring improved literacy, better health status, greater self-reliance, improved public policy and more efficient and effective uses of public funds. All of these benefits to individuals and to society are also indispensable to growing and sustaining an innovation economy.

1.3. What is an Innovation Strategy?

An innovative economy requires planning and support. It needs appropriate infrastructure, a well-trained workforce, knowledge and expertise, strong cooperation and partnerships, appropriate regulatory and financial supports, and an environment that recognizes, encourages and rewards creativity and inspires confidence in our risk-takers.

Newfoundland and Labrador's Innovation Strategy is a carefully considered plan to increase our capacity for innovation in our economy and society so that we can grow and prosper. This involves identifying specific initiatives in key areas that will stimulate, support and capitalize on innovation, establishing goals and objectives to support these strategies in specific areas, and taking action to achieve these goals.

It also considers existing initiatives which are essential to support and complement our Strategy, and places them within government's overall innovation agenda.

The Strategy considers where we are at present, where we need to go, and the best way to get there, in light of our circumstances, strengths and resources. It also considers our position within the "big picture," within Canada and within a rapidly changing and increasingly competitive global economy.

Our Innovation Strategy will become an important part of government's policies, particularly those related to economic and social development, education and training, industry and trade, public services and infrastructure, culture, and investment and finance. Working together with all our partners and stakeholders, the Strategy will help us build a strong and dynamic innovation system for our province, today and in the future.

1.4. An Innovation Strategy for Newfoundland and Labrador

Our Blueprint for the Future stated, "Growth industries depend on the continuous generation of technological innovations and the rapid transformation of these innovations into commercial products. While the provincial technology sector is small, local companies have shown that they can compete with the best in the world - and win!" Echoing this statement, the 2004 Speech from the Throne committed to developing a comprehensive innovation strategy that identifies and builds upon emerging opportunities in a wide range of disciplines.

In developing its Innovation Strategy, government has also been mindful of the importance of supporting and maintaining the strengths and unique character of our Newfoundland and Labrador culture. Our new commitment to innovation must draw on and reinforce our traditions of perseverance and creativity, and our long-standing entrepreneurial spirit as well as promote an openness to new ideas and global perspectives. It must strengthen our confidence in ourselves and our knowledge that we can be the best in the world.

Government has developed this Innovation Strategy based on substantial research, considerable expert opinion, a careful consideration of our strengths and our challenges, and, most important of all, the advice and direction it received from many stakeholders across the province who participated in our consultation process.

The following sections describe some of the elements that have influenced and contributed to the development of this process, and how government has moved forward with its plan to make Newfoundland and Labrador a more innovative and prosperous place in which to live and work.

1.4.1. The Federal Government Initiative

In February 2002, the Government of Canada launched its national innovation strategy, contained in two principal documents, *Achieving Excellence* and *Knowledge Matters.* Its aim is to ensure that Canadians increase their competitiveness in an increasingly demanding global economy, so that we can maintain and improve our standard of living and quality of life.

The federal strategy builds on current investments in research and innovation, makes essential research, knowledge and expertise available to large and small firms alike, and increases access to venture capital financing. It considers four strategic areas:

- *Knowledge performance* – encouraging firms to reap more benefits from creating knowledge, bringing ideas to market, and increasing Research and Development (R&D) investment in all sectors;
- *Skills* – ensuring that Canada has enough highly-trained and educated individuals, often called "highly-qualified people" (HQP), needed for a vibrant, knowledge-based economy;
- *Innovation environment* – modernizing business and regulatory policies to support investment and excellence in innovation; and
- *Strengthening communities* – supporting innovation at the local level so that communities continue to be magnets for investment and new opportunities.

Since the release of the national strategy, several Canadian provinces have developed their own innovation agendas or strategies, in most cases building on the federal approach and addressing particular priorities and circumstances within their own borders.

Recent studies by the federal government emphasize the need to optimize the potential of Canadians by using science, technology and entrepreneurship to diversify and build a smarter knowledge economy. Central to their recommendations is the establishment of a national Commercialization Partnership Board to guide the federal government on commercialization activities and choices. Increased education, training, R&D and capital for SMEs have been identified as essential components.

1.4.2. Consultations and Research

The Government of Newfoundland and Labrador is committed to developing policies and undertaking key initiatives based on consultation with stakeholders and the public in all regions of the province. Consequently, a focused consultation process was among the first steps taken toward developing our Innovation Strategy.

An initial meeting with stakeholders was held in September 2004. That meeting included:

- senior representatives from the federal government – Industry Canada, the Atlantic Canada Opportunities Agency (ACOA), and the National Research Council - Industrial Research Assistance Program (NRC-IRAP);
- academic and research institutions – Memorial University of Newfoundland (MUN) and the College of the North Atlantic (CNA);
- industry associations – Newfoundland and Labrador Association of Technology Industries (Nati), Canadian Manufacturers and Exporters (CME) and the Canadian Federation of Independent Business (CFIB);
- the Newfoundland and Labrador Regional Development Association (NLRDA); and
- municipal representatives.

In Fall 2004, government solicited proposals for a consultant to conduct research and help develop the Strategy, as well as to plan and convene further province-wide consultations. AMEC Earth & Environmental of St. John's was chosen.

In February 2005, government issued its discussion paper to support the consultation process. In addition to information about the strategy development process and how to participate, it provided background information, raised issues and posed questions to stimulate discussion.

Beginning in February 2005, AMEC convened 12 formal round tables, each with 20 - 60 participants, as well as 18 focus groups, involving 10 - 15 stakeholders each, and conducted a further 50 key informant interviews. In addition, stakeholders and the public were encouraged to submit written briefs to government about what our Strategy should contain and what we should aim to accomplish. In total, more than 500 individuals and organizations participated, including 25 who submitted written comments or formal briefs.

In addition, AMEC undertook extensive research, including investigation of international innovation performance trends, strategic approaches in other jurisdictions and innovation indicators. They also completed an economic overview and conducted an extensive SWOT analysis (of strengths, weaknesses, opportunities and threats) for the Strategy.

In October 2005, AMEC presented its final report to government, *Newfoundland and Labrador Innovation Report* (www.gov.nl.ca/intrd/innovation), containing the results of its research, analysis and consultations, and summarizing the views of stakeholders. It also provided advice on a model for innovation, as well as proposing several specific strategies.

1.4.3. A Partnership Approach

In developing the Innovation Strategy, government has drawn on the substantial research conducted, considered the experience of other jurisdictions, and weighed the specific advice, expectations and needs of Newfoundlanders and Labradorians expressed through the consultation process. The Strategy was also developed considering our fiscal capacity to support initiatives, and recognizing that we have to sustain this agenda for the long term.

This Strategy is not owned solely by government; it is based on a partnership with all of our citizens. Just as it reflects the needs and advice of our stakeholders, it has to be carried forward by them, too. Government's responsibility to implement the Strategy is shared by our businesses, development groups, workers, educators, students, financiers, unions, researchers, administrators and the public. We all share this responsibility and we will all share the benefits of its success.

This Innovation Blueprint is a starting point. It will help guide our agenda as we build our innovation economy over the next several years, but the process will need to continue long after that. This document provides a five-year vision that will be revisited and

The St. John's Board of Trade is pleased that government has embarked on this process to develop a provincial Innovation Strategy. The Board of Trade believes that this strategy will be essential to evolving and enhancing our economy, by guiding the province toward creating a competitive, high-performance knowledge-based component to the economy and achieving sustainable growth well into the future.

- St. John's Board of Trade

reviewed in light of the changes that will continue to occur in our economy and the global marketplace. We will evaluate our success in implementing the Strategy and establish new goals and objectives as needed. We will monitor its effectiveness annually, using specific performance measures (see Chapter 6). This will help to ensure that Newfoundland and Labrador's Strategy has the flexibility and responsiveness needed to meet new challenges with innovative solutions.

The rest of this document describes our Innovation Strategy and how it will work to strengthen our innovation system - the network of components and relationships that make up and support an innovation economy. Chapter 2 describes our current innovation status and some of the challenges we face in becoming more innovative, more competitive and ultimately more prosperous. Chapter 3 presents the fundamental elements of government's innovation system and our model for implementing the Innovation Strategy. Chapter 4 presents the Strategy's major directions and specific goals and objectives. Chapter 5 describes new actions, and the other supporting or complementary initiatives now under way which will be the means of implementing the Strategy.

Chapter 6 sets out how we will monitor and measure improvements in innovation performance, and Chapter 7 considers what it will take to go from this Blueprint to a well-built innovation system.

Our Innovation

Status

2. Our Innovation Status

2.1. What Makes Economies Innovative?

As our definitions of innovation indicate, there are certain basic elements that make some economies more innovative than others. As a general rule, the stronger these elements are, the more competitive and prosperous the economy.

These elements include the financial system (incentives, taxation and access to capital), the regulatory regime, the skills and education of the workforce, levels of R&D activity, the quality of transportation, communications and other physical infrastructure, industry structures and methods of doing business. The latter includes market opportunities and the extent to which organizations work together to achieve common goals. Overlaying all of this, innovative regions promote a culture that values and encourages the creation and application of new ideas and builds people's confidence in their ability to take risks and succeed.

In Finland, for example, a focus on innovation and invention dating back several decades has positioned that country as a leading innovator with many new products succeeding in international markets. Although a forestry and farming economy early in the 20th century, the country transformed itself into an industrial economy and entered the new millennium as a strong competitor and performer in the international services and knowledge-based sectors. Today, Finnish researchers are involved in leading-edge work in such areas as low-temperature physics, communications technology, biotechnology, neural networks, brain research and genetic technology, as well as developing new products from their forest resources.

The Republic of Ireland has also achieved significant success in innovative areas and by applying innovative approaches in recent decades. Substantial investments in education and research have been critical to its success, enabling the change from a resource-based to a knowledge-based economy, with substantial foreign investment. A steady focus on its innovation system is now encouraging both foreign and domestic companies to invest in new research and innovation in Ireland, opening a new chapter in its rise in economic status.

In this province, substantial investments have already been made by governments and other institutions to encourage and support a diversified economy. These are important assets that support an innovation economy, and many are described in Section 2.2. Although these investments and other initiatives have achieved significant economic returns, our performance still lags behind the rest of Canada and other parts of the developed world. Several of the factors and challenges responsible are described in Section 2.3. Our Innovation Strategy is about working with all of our stakeholders and partners to find realistic and sustainable solutions that meet these challenges.

2.2. Our Innovation Assets

This section describes some of our current capacity and capabilities in key areas that make regions innovative. These are substantial assets and provide a strong foundation to help implement our Innovation Strategy.

2.2.1. Research and Development

Newfoundland and Labrador is already recognized world wide for expertise in certain areas. In ocean science and marine technologies, for instance, we are international leaders and innovation is strong. One reason for this is the world-class R&D facilities and expertise located in the province, most notably those within Memorial University of Newfoundland and the College of the North Atlantic.

Memorial's leading-edge R&D centres include the Canadian Centre for Fisheries Innovation (CCFI), the Ocean Sciences Centre, the Bonne Bay Marine Station, the Centre for Applied Health Research, the Biomedical Engineering Centre and C-CORE. The university is also home to the Marine Institute which houses the Centre for Sustainable Aquatic Resources, the Centre for Aquaculture and Seafood Development, the Centre for Marine Simulation, the Canadian Centre for Marine Communications (CCMC) and the Offshore Safety and Survival Centre.

Memorial's Computing, Simulation and Landmark Visualization Laboratory provides students, faculty and government agencies with state-of-the-art facilities for imaging, modeling and simulation. This immersive large-screen visualization laboratory, the first of its kind at a university, allows up to 20 researchers at a time to view complex structures (e.g. an oil reservoir hundreds of metres below the sea floor, a human heart or the folding of a DNA molecule) in four dimensions (temporal plus three spatial dimensions).

Memorial is a founding member of the new Centre for Marine Compressed Natural Gas, the world's first research and development facility dedicated to the safe, efficient and competitive transportation, storage, handling and use of compressed natural gas (CNG).

Funded by industry and governments (including the federal Atlantic Innovation Fund, AIF), this world-class facility will partner with industry and other research entities to conduct R&D programs to meet industry needs and supply research and development services to national and international clients. The Centre recently moved into its new large-scale R&D facility in St. John's.

The Campus Incubation Consortium (CIC) is a strategic and coordinated approach to technical and business incubation on the extended Memorial University campus. A collaborative arrangement has been forged among the Enterprise and Entrepreneurship Gateway of the P. J. Gardiner Institute, the Genesis Group Inc., the INCO Innovation Centre, the National Research Council - Institute for Ocean Technology (NRC-IOT), the NRC-IRAP, and the Faculty of Engineering and Applied Science. This formal collaboration provides new entrepreneurs with a single point of entry to a range of services. This supports a continuum of technology-based projects from early-stage ideas (Genesis Innovation Works) to near investor-ready projects requiring access to the marketing, finance and management expertise of world-class mentors and board members (Genesis Centre).

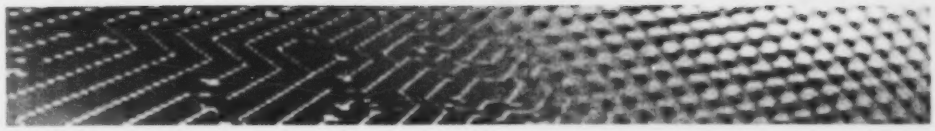
The Department of Computer Science also encourages linkages with local industry. The faculty is international in composition and recognition, and works to strengthen its international links and reputation. Technical resources in the department are indispensable to the improvement of the IT infrastructure of the university as well. The department has many areas of active research, including artificial intelligence, bio-inspired computing, computer graphics, vision and image processing, and wireless and sensor networks.

Memorial University is leading the Atlantic Computational Excellence Network (ACEnet), a partnership of seven Atlantic Canadian universities. With funding from the Canada Foundation for Innovation and its provincial and private sector partners, ACEnet is building the most advanced high-performance computing (HPC) network in Canada. This will support academic and private-sector research in areas such as computational chemistry, materials physics, computer science, ocean technology, astrophysics and pharmaceuticals. Memorial was also the first university in Canada to offer an interdisciplinary Master of Science in Computational Science.

To maximize access to, and use of, its major research equipment, Memorial has developed an innovative approach with its Core Research Equipment and Instrument Training (CREAIT) Network. Through interconnected satellites across the St. John's campus, CREAIT is responsible for maintaining and operating thematic clusters of multi-user equipment, training faculty and students in the use of core equipment, and promoting new research partnerships which include the private sector.

The College of the North Atlantic (CNA) has also established an international profile as a world-class exporter of education services using innovative approaches to curriculum and delivery. Most notably, it has established a state-of-the-art campus in the State of Qatar in the Middle East. CNA also operates R&D centres, such as the Manufacturing Technology Centre in St. John's, which provides support to the manufacturing sector, and the Digital Animation Centre in Stephenville, which trains students to work in this emerging field. The College's Geospatial Research Facility on its Corner Brook campus is a major research initiative to conduct comprehensive assessment of the province's terrestrial resources using advanced mapping, sensing and data collection techniques. It also significantly expands Atlantic Canada's research and innovation capacity in the terrestrial resource sectors. R&D is further supported by the College's new Office of Applied Research.

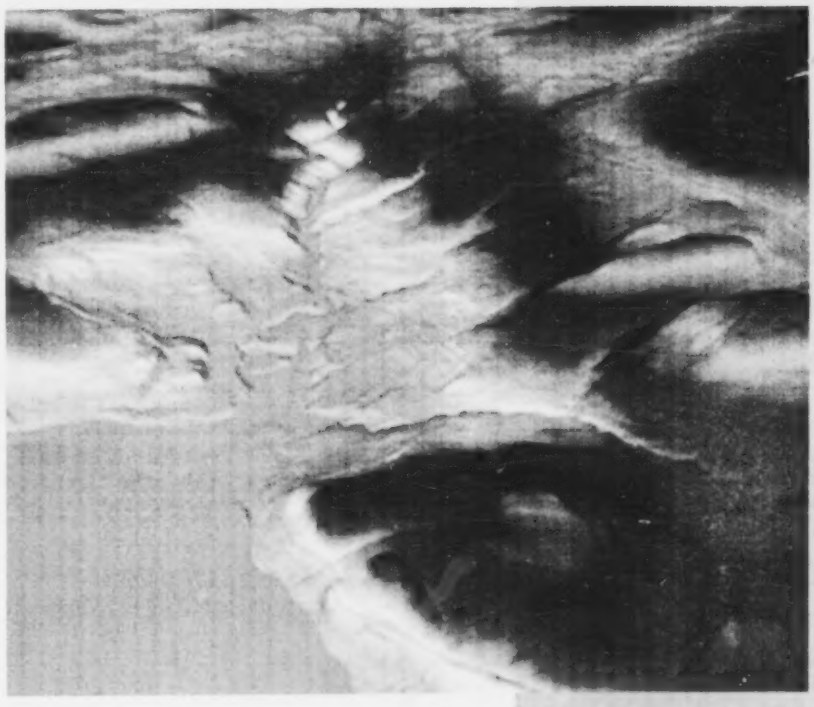
NRC-IOT performs applied research and works with companies to assist them in using or delivering leading-edge ocean technologies. NRC-IOT, NRC-IRAP and National Research Council - Canada Institute for Scientific and Technical Information (NRC-CISTI) have worked together to facilitate the development of OceansAdvance, the marine technology cluster initiative in St. John's.



Led by CCMC, Placentia Bay on the South Coast of Newfoundland will host the SmartBay demonstration project. The project will illustrate the benefits of improved access to information for the sustainable development of the diverse coastal and ocean resources in the bay, and the management of its complex industrial assets and opportunities. This will be accomplished by establishing an information platform that employs both new and existing data, infrastructure and technology. As well, it will be expandable to include other technology, data sources and applications in the future. This project will enhance the way we understand, use and manage marine operations and could provide a foundation for large-scale ocean observing systems in the Northwest Atlantic.

While the marine sector has been a traditional focus for R&D investment in our province, we also have strong capabilities in many other areas, such as conducting world-class cellular and molecular research and clinical trials. The Faculty of Medicine at Memorial University is home to leading population genetics/genomics and cancer research, and private sector companies are involved in similar research activities. We also have widely-recognized expertise in mobile communications, distance education and environmental systems. Our remote sensing and asset tracking services serve the international marketplace.

College of the North Atlantic's Geospatial Research Facility at the Corner Brook campus is a major research initiative created to conduct comprehensive assessment of the province's terrestrial resources using advanced mapping, sensing, and data collection techniques.



Internationally-recognized and award-winning research at Memorial University's Telehealth and Education Technology Resource Agency (TETRA) has led to development of technology that allows the transfer of medical images and data to remote areas. It has been adopted in such countries as Scotland, Uganda, Kenya, the West Indies and the Philippines. TETRA has developed expertise and experience in videoconferencing, web-based programming and the management of both terrestrial and satellite networks.

To support commercialization of university-based research and development in Atlantic Canada, 14 Atlantic universities have recently established Springboard Atlantic. The initiative, which is cost-shared by AIF, NSERC and the universities,

aims to expedite the movement of new discoveries and inventions from the institutions into the marketplace. Technology transfer specialists will help assess commercial potential and provide patent expertise.

A partnership between Memorial and global nickel producer INCO Ltd. resulted in the $20 million INCO Innovation Centre (IIC). Approximately 50 per cent of the IIC is dedicated to research related to the exploration and exploitation of mineral deposits, including process engineering, process simulation and control systems required for hydrometallurgy as well as health, safety and risk engineering. The remainder is dedicated to more general innovation including the Genesis Innovation Works, the Genesis Centre, and research space for multidisciplinary activities (e.g. the Newfoundland and Labrador Centre for Applied Health Research).

In October 2005, INCO opened a demonstration plant, a major R&D project to investigate the commercial application of hydrometallurgical technology (hydromet) for Voisey's Bay nickel concentrates. This innovative technology is more environmentally friendly and economical as it does not require smelting the ore.

In other sectors, such as oil and gas, fisheries, aquaculture, health, tourism and cultural industries, our innovative approaches, ideas and technologies are attracting attention well beyond our borders. In agrifoods, our provincial research station is dedicated to science and innovation, particularly related to crops for northern climates, and the federal-provincial funding program on agrifoods has its own science and innovation component. Labrador is also emerging as a diverse and advanced agricultural region, utilizing new technologies and innovative production management practices.

Other supports for R&D in the province include a strong and growing information and communications infrastructure with leading-edge broadband capabilities being built throughout the province; financial incentives, such as our Industrial Research and Innovation Fund (IRIF) which supports our public institutions; and increasing collaboration among our research institutions, government and industry. Chapter 5 and the Appendix describe these supports and others in more detail.

2.2.2. Education

Newfoundlanders and Labradorians place a high value on education. University participation rates in this province are higher than the national average and, at the college level, participation is the highest in Atlantic Canada. Our investment in education is high: about 6.4 per cent of our provincial Gross Domestic Product (GDP) in 2004, compared to 4.5 per cent for Canada. Since the opening of Memorial College in 1925, through the construction of our vocational schools starting in 1963, and with the tremendous expansion of our institutions since then, government has worked to ensure that our system of public post-secondary education supports the social and economic development of this province.

The College of the North Atlantic, our public college system, is one of the largest such institutions in Atlantic Canada. It offers programs in such areas as information technology, engineering technology, health sciences, applied arts, natural resources, business and industrial trades. It has 17 campuses across the province, a campus in Qatar and several satellite sites.

Memorial University's facilities include its St. John's campus and the Marine Institute in St. John's, Sir Wilfred Grenfell College in Corner Brook, and a

residential campus in Harlow, England. It is the largest university in the Atlantic Provinces and offers programs at the bachelor, master and doctoral levels. MUN is also home to professional schools and faculties such as Medicine, Nursing, Pharmacy, Business Administration, Education, Engineering and Applied Science, Music, Social Work, and Human Kinetics and Recreation, and hosts several specialized institutes and centres involved in R&D and other initiatives.

These institutions are actively engaged in building productive and innovative partnerships with business and labour in the province. In 2000, for example, Memorial and its partners established the Oil and Gas Development Partnership, with several new programs, graduating students annually at the masters and doctoral level. In 2001, the $5 million Southside Marine Base was opened to train petroleum and marine transportation workers in offshore safety and survival techniques. The Leslie Harris Centre of Regional Policy and Development (Harris Centre) co-ordinates and facilitates the university's educational, research and outreach activities in regional policy and development, and serves as an access point between stakeholders and the university in these areas. In addition to research in health and telecommunications, TETRA also provides distance education services in the health field.

Memorial's Distance Education and Learning Technologies (DELT) is one of the largest providers of distance education among comprehensive Canadian universities. Using the latest technologies to support and enhance teaching and learning, DELT offers distance programming in degree areas such as business, education, health, maritime studies, social work, and technology throughout Newfoundland and Labrador and beyond. DELT is also affiliated with the Centre for Distance Learning and Innovation (CDLI) and the Canadian Virtual University.

Petro-Canada Hall, the new performance and rehearsal facility in the university's School of Music, is a unique blend of art and technology. With state-of-the-art equipment for both recording and Web-casting, the facility links the School of Music to global communities for real-time distance instruction and multi-site rehearsal.

College of the North Atlantic (CNA) provides tailored and often innovative curricula to businesses, labour, community organizations and many other clients. Training programs include courses in business, health care, safety and risk management, multimedia and information technology, oil and gas, forestry,

Memorial University's Petro-Canada Hall is a state-of-the-art performance and rehearsal facility which links the School of Music to global communities for real-time distance instruction and multi-site rehearsal.

environmental sciences, and mining. Its Labrador West Campus offers a Mining Technician Program in partnership with the Iron Ore Company of Canada (IOCC), and the Clarenville and Bay St. George campuses have installed an Open Learning Information Network (OLIN) facility. The College also fosters entrepreneurship and small business incubation, supporting product R&D.

The provincial Department of Education's CDLI applies information and communications technologies (ICT)[1] to develop and deliver educational programs and services in the province. These include coordination and delivery of K-12 instruction and online professional development service in partnership with the Newfoundland and Labrador Teachers Association (NLTA). In September 2005, CDLI was chosen to coordinate and administer a new $24.9 million agreement among the Government of Canada, the Government of Newfoundland and Labrador and Persona Communications Corporation to provide broadband access to 68 schools and 103 communities in rural and remote regions of the province.

Within our high school system, students take a range of courses in enterprise education where they learn about, and are encouraged to consider, entrepreneurship, self-employment or skilled trades as viable career choices.

In communities and regions throughout the province, the educational system also plays an invaluable role through formal and informal economic development activities by providing community leadership and by way of graduates who work and contribute in every area.

Through the actions outlined in its White Paper on Public Post-Secondary Education (2005), government will strengthen this base and support an excellent public post-secondary education system which is affordable, accessible, collaborative, sustainable and accountable. These, too, are essential components of an innovative society.

2.2.3 Business Environment

Newfoundlanders and Labradorians have a long-standing commitment to entrepreneurship and a history of successful mercantilism and international trade dating back hundreds of years. In recent decades, and especially in the past few years, government has strongly supported and strengthened this base to improve our business environment through education, infrastructure development, financial incentives, and community and economic development strategies. It has also worked with its partners throughout the province to broaden our economic base, by identifying or creating new opportunities for development in all our regions.

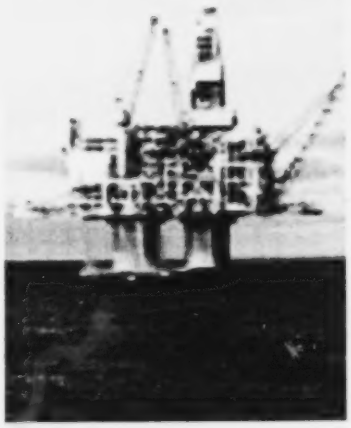
Industry Sectors Our traditional resource-based industries, particularly fishing, forestry and mining, are still extremely important components of our business environment. Although they face many challenges, they are still foundational elements of our economy. Thousands of people continue to be employed in these industries, especially in rural parts of the province, and we need to ensure that they are as firmly a part of our future as they have been of our past.

The province's fishing industry, for example, has adapted to drastic changes over the past decade and a half. When important groundfisheries were closed in most areas, fishers responded by pursuing new species, undergoing an extensive industry restructuring, and adopting an innovative training and professionalization system. Today, the harvesting sector is strong, with many enterprise owners having invested in the latest innovations in computer, communications and satellite navigation technologies.

[1] ICT is a general term for computer infrastructure required by advanced economies in a wide variety of areas (e.g. teaching, learning, research), through various methods.

Aquaculture also continues to show potential and can benefit further from the development and application of innovative techniques and processes. The Department of Fisheries and Aquaculture has been actively supporting innovation through research, program support, technology transfer and directly with industry through an Aquaculture Innovation Fund that partners with companies to explore, evaluate and adopt new technology and new processes to improve profitability.

The manufacturing sector is a significant contributor to our economy. It is characterized by a large number of small to medium-sized firms throughout the province in emerging and traditional industries. These include agrifoods, boat building, fish processing, wood and building products, craft, gift and apparel, metalworking, and plastics and composites. Over the past ten years, the sector has experienced high levels of capital investment, with average real investment growth of more than 16 per cent a year, and has benefited from increased international and interprovincial exports. Since 1995, manufacturing shipments have grown significantly, with the value of shipments increasing from $1.6 billion in 1995 to $3.1 billion in 2004. The continued growth of the sector is dependent on the production of innovative products and the adoption of innovative production processes.



Among our newer industries, the offshore petroleum sector has had a profound effect on the business environment of this province over the last decade or so. Offshore petroleum is now our most valuable export and the source of substantial fiscal (e.g. royalties and taxes) and economic (e.g. employment) benefits. In 2005-06, the sector is expected to make up nearly 17 per cent of our provincial GDP, in addition to generating thousands of jobs in direct employment and in supplying and servicing the industry. If we continue to explore and tap into our undiscovered potential- estimated to be a further six billion barrels of oil and 60 trillion cubic feet of natural gas – we will play an increasingly important role in meeting North American petroleum needs, and our industry will continue to grow.

To date, our three producing oil fields, Hibernia, Terra Nova and White Rose, have resulted in the development of extensive core infrastructure and expertise in this province. Many national and foreign companies operating in our offshore have established offices in Newfoundland and Labrador, and several national and international supply and service companies have set up operations here to support our industry. In addition, many local companies have expanded and new firms have been created to supply services and goods to the petroleum industry.

Since Hibernia, there have been many joint venture and partnership arrangements between provincial companies and other Canadian or foreign firms. Many local entrepreneurs and enterprises have benefited from the technology transfer that has resulted in gaining new knowledge, skills and experience. In many cases, this has allowed Newfoundland and Labrador firms to compete successfully in the international marketplace.

If CNG proves to be a viable option for marketing our offshore natural gas resources, a further set of opportunities for skills, technology and business development could open up in the province.

Another important development within Newfoundland and Labrador's business environment is the emergence of several strategic industry clusters. Clusters are groups of enterprises, institutions and/or other agencies with common or complementary interests, technologies and/or expertise. Working together in strategic partnerships, their combined expertise and experience create a competitive advantage for all the participants.

For example, the province's marine technology sector is composed of 50 firms that employ more than 1,000 people with sales of more than $250 million annually, involved in such areas as electronics, communications, software, and instrumentation. Several of these companies are at the forefront of technological development, providing innovative products and services to meet the changing needs of various marine industries. Most firms and support infrastructure are on the Avalon Peninsula with ready access to the Marine Institute,

Memorial University and NRC-IOT. Government is currently working to expand this sector, leveraging federal funds in line with the national Ocean Action Plan and Technology Roadmap for the sector.

Our life sciences sector is a small but emerging contributor to our economy. Local capabilities include innovative product development and research in the areas of marine biotechnology, nutraceuticals, biotechnology, genomics, clinical trials and biopharmaceuticals. Infrastructure for the sector has been increasing through the improvement of capabilities at both the research

facility and business levels (e.g. MUN's School of Pharmacy and Faculty of Medicine, the Newfoundland and Labrador Centre for Health Information, NLCHI).

The province's Information, Communications and Technology (ICT) industry is mature and working to leverage joint projects. The province has several nationally-recognized ICT organizations, including the CCMC, TETRA, and CDLI.

In a sector increasingly dominated by large corporations, our small and medium-sized aerospace and defence sector firms are thriving. Our province is home to approximately 30 knowledge-intensive enterprises developing innovative aerospace and defence products for niche markets worldwide. The client base for local companies includes many of the world's major aerospace and defence prime contractors. Their products and services include engineering and manufacturing, leading-edge space technologies, and nationally acclaimed professional training.

On the west coast, a cluster or centre of excellence has emerged for environmental education, research, technology and development. Over the past five years, in excess of $20 million in federal and provincial funding has supported a number of interrelated innovative projects including:

- the Forestry Centre at Sir Wilfred Grenfell College;
- the Newfoundland and Labrador Institute for Biodiversity and Ecosystems Science;
- the Western Newfoundland Model Forest Network;
- the Canadian Forest Service of Natural Resources Canada;
- the Forestry and Natural Resource programs offered at Sir Wilfred Grenfell College and College of the North Atlantic;
- the Geospatial Research Facility at College of the North Atlantic;
- the Bonne Bay Marine Station of Memorial University of Newfoundland at Norris Point;
- the Humber Education Alliance International Student Recruitment, and
- the Aquatic Centre for Research and Education.

As a UNESCO World Heritage Site, Gros Morne National Park is one of the province's national and international tourism icons and the anchor of a cluster of tourism activity on Newfoundland's west coast that extends up the Viking Trail from Deer Lake to St. Anthony, and across the Strait of Belle Isle to Southern Labrador. The Gros Morne Institute for Sustainable Tourism (GMIST), based in Rocky Harbour, was established by a consortium of such leading tourism industry players including Hospitality Newfoundland and Labrador (HNL), ACOA, Tourism Atlantic, the Canadian Tourism Commission and Parks Canada. GMIST is dedicated to advancing the quality and success of Atlantic Canadian tourism operators through an array of innovative training programs developed and offered at the Institute. GMIST is helping to build the capacity of Atlantic Canada's tourism operators to reach new international and domestic markets.GMIST also has established a database of tourism training programs and courses being delivered in Canada and beyond, by colleges, tourism industry associations and government agencies.

Industry Organizations, Business and Labour Support Several strong industry-driven organizations support both established and emerging industries in this province. Oceans Advance is working to make the St. John's region an international location of choice for ocean technology through a partnership among business, R&D institutions and government. Other organizations working to foster strong industry sectors include the Newfoundland and Labrador Association of Technology Industries (Nati), the Newfoundland Ocean Industries Association (NOIA), the Aerospace and Defense Industry Association of Newfoundland and Labrador (ADIANL), the Newfoundland and Labrador Environmental Industry Association (NEIA), Canadian Manufacturers & Exporters (CME) Newfoundland and Labrador Division, the Newfoundland Aquaculture Industry Association (NAIA), and other industry groups.

Businesses are further supported by the Canadian Federation of Independent Business, the Newfoundland and Labrador Business Caucus, the Newfoundland and Labrador Employers' Council, and Boards of Trade and Chambers of Commerce throughout the province. The Federation of Municipalities and its members also work to ensure supportive environments for businesses and economic development within their constituencies.

The Canada/Newfoundland and Labrador Business Service Network and the Aboriginal Service Network operating in communities around the province, are partnerships of business service providers offering information services for businesses, including research assistance for the development of business plans and access to computer workstations.

The Newfoundland and Labrador Organization of Women Entrepreneurs (NLOWE) supports women entrepreneurs through its network of community-based facilitators, members, clients and partnerships throughout the province. Other organizations such as Women in Resource Development Committee, the Canadian Coalition of Women in Engineering, Science, Trades and Technology and Women Building Futures exist to promote the opportunities for women in areas where they are under-represented.

Workers in all areas are supported by many strong professional organizations, unions and associations active within the province. The Newfoundland and Labrador Federation of Labour (NLFL) works to promote the interests of unionized and non-unionized workers in labour relations, labour standards, health and safety, and workers' compensation, and promote economic development, social programs and human rights.

The province's Regional Economic Development Boards (REDBs) bring together a range of development partners, including governments, educators, business, labour and development groups, to provide planning and support for existing and new business opportunities in their zones. The federal-provincial Business Retention and Expansion (BR&E) initiative is a community-based program that helps community leaders identify barriers facing local businesses and find appropriate measures for enhancing the region's business base. Government's Rural Secretariat works with the regions on a broad range of economic, social, cultural and environmental issues.

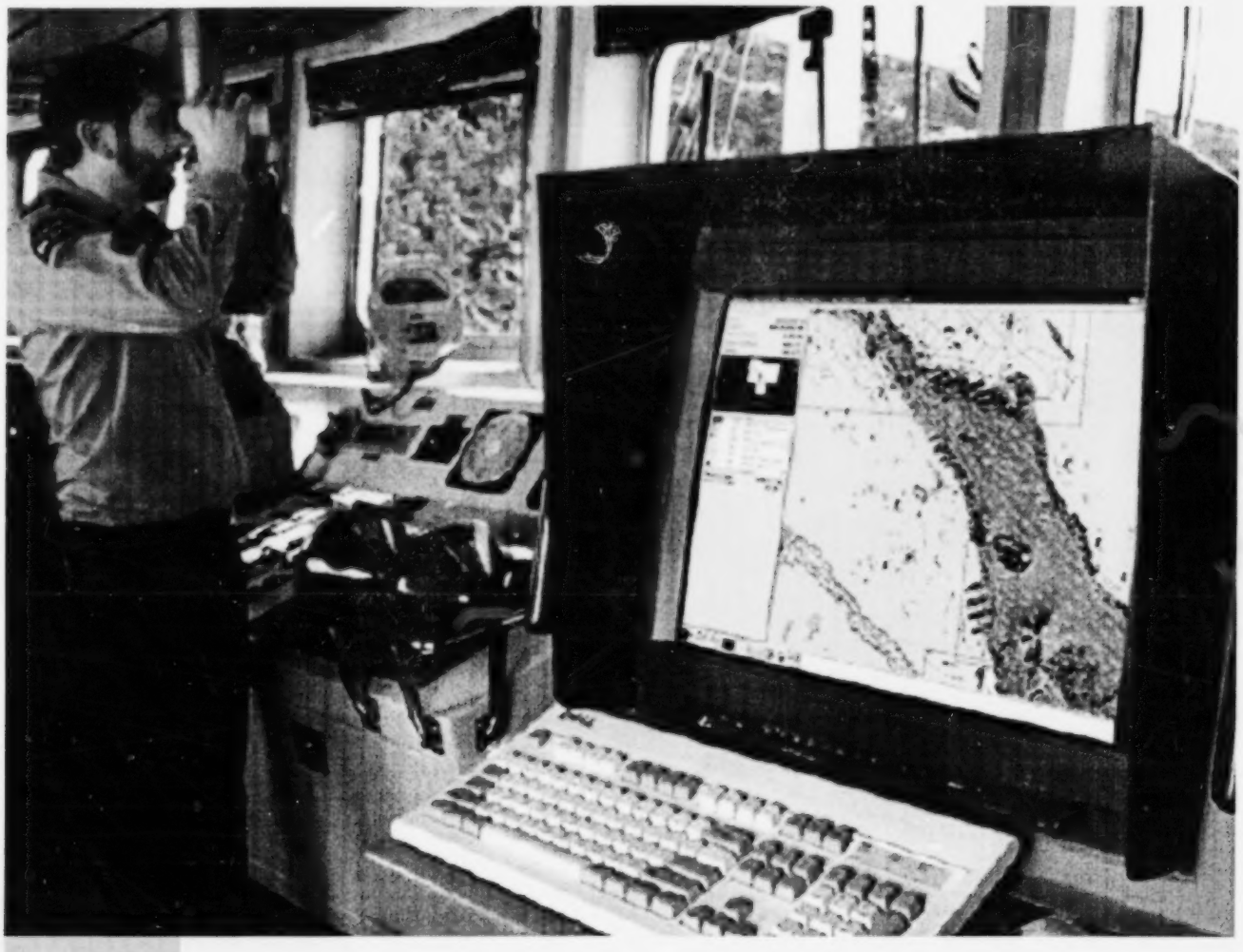
The GrowthWorks Atlantic Venture Fund provides a new source of venture capital for small and medium-sized enterprises in the province with good growth potential in emerging areas of the economy.

Financial Supports In addition to access to federal programs, through ACOA, the Business Development Bank of Canada (BDC) and Community Business Development Corporations (CBDCs), provincial supports for business development and entrepreneurs are distributed broadly throughout the province. Several of these are described in Chapter 5 and in the Appendix of this document.

Since the level of private sector investment in the Atlantic region has been low compared to other regions, the federal government has implemented several initiatives, most notably the Atlantic Investment Partnership, an infusion of $410 million over five years via the AIF and NRC.

The GrowthWorks Atlantic Venture Fund provides a new source of venture capital for small and medium-sized enterprises in the province. This labour-sponsored venture capital corporation (LSVCC) will target emerging areas of the economy, providing support for enterprises that have good growth potential.

The province's Economic Diversification and Growth Enterprises Program (EDGE) encourages and supports new business investment by providing significant tax and other incentives,



with the aim of diversifying the economy and stimulating new private-sector job creation.

Taxation affects a jurisdiction's ability to attract and encourage innovation and innovative industries. Although our personal income tax rates are higher than other jurisdictions, Newfoundland and Labrador's corporate tax rates are competitive with the rest of Canada, with a general corporate rate of 14 per cent, a manufacturing and processing rate of five per cent, and a small business rate of five per cent.

The province's portion of the Scientific Research and Experimental Development (SR&ED) Tax Credit supports R&D by providing a refundable tax credit of 15 per cent of eligible expenditures for scientific research and experimental development activities carried out in this province.

Information Infrastructure

Newfoundland and Labrador participates in Canada's advanced internet development organization, CANARIE Inc. It is a not-for-profit corporation supported by its members, project partners and the federal government. The latest enhancement to this network, dubbed CA*net 4, advances its mandate to accelerate the development of Canada's advanced internet, interconnect provincial research networks, including universities, research centres, government research laboratories and schools, and link them to international peer networks. Although the current level of connectivity between the province and the rest of Canada has the lowest data transfer capacity within the country, initiatives such as the National Platforms Fund of the Canada Foundation for Innovation (CFI) and government's broadband initiative are studying ways to increase the competitiveness of this link.

The provincial broadband initiative was launched recently to review government telecommunications needs and explore opportunities for leveraging government's vast

purchase of telecommunications to bring competitive access to more communities in the province. By building broadband capabilities throughout the province, we are decreasing the competitive disadvantages associated with distance and remoteness. Such initiatives are essential for supporting our business environment and fostering innovation.

2.3. Our Innovation Challenges

Although we have a good foundation to build on – a strong educational system, excellent R&D capabilities in several areas and a growing business support network in our regions – studies indicate that Newfoundland and Labrador's innovation performance is not keeping up with the rest of Canada and some other regions of the world.

The province has been working to understand our competitive position in relation to other jurisdictions. Research reveals that our overall competitiveness has been mixed. While we usually perform well on measures that reflect improving performance over time, we are weaker on absolute levels of performance. This indicates that while our recent economic progress has been strong, we still lag behind other jurisdictions. Within Canada, Newfoundland and Labrador typically ranks among the top provinces for some measures of competitiveness, but among the lowest for most.

Among our lowest ranking indicators are several that reflect our innovation capacity. These include R&D spending as a percentage of GDP, private sector investment in innovation and commercialization activities, and the proportion of total employment in R&D related activities.

Our research has shown there are several factors that contribute to the province's lagging performance, including:

- a relatively low level of investment in R&D by the private sector;
- with the exception of several sectors, limited resources at our university, college and other institutions to carry out R&D activities compared to other regions;
- limited access to private-sector risk capital and financing for commercialization;
- limited linkages and collaboration among post-secondary institutions, industry and communities;
- insufficient knowledge-based infrastructure, particularly in rural areas;
- entrepreneurs, managers and professionals lacking experience in using innovation and building innovative enterprises;
- levels of bureaucracy and regulatory requirements;
- a continuing out-migration of knowledge industry and other skilled workers;
- a reliance on primary resources in rural areas; and
- demographic and geographic challenges, including a small and changing population and a vast geography, and the challenges these create for developing capacity and reaching clients and markets.

The following sections discuss various aspects of these factors under the headings of R&D, education and business environment.

Despite recent events, given the fiscal challenges within our province, it is evident that we cannot outspend competing jurisdictions in relation to innovation. As a result, the province must be strategic in its innovation investments, ensuring that such investments both enhance and exploit our current strengths.

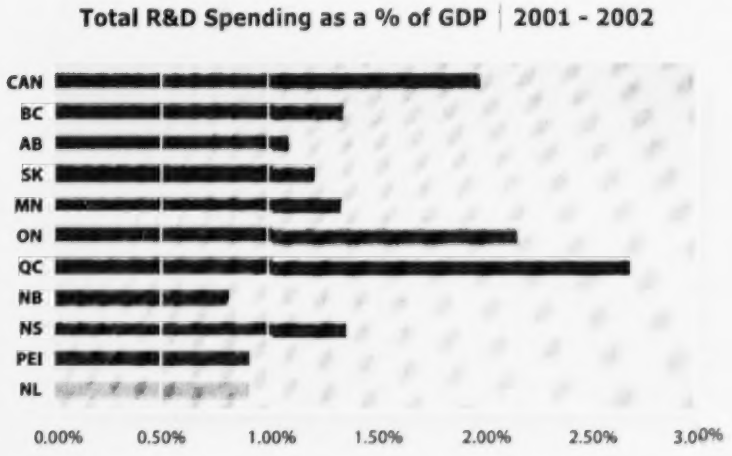
- Newfoundland and Labrador Business Caucus

2.3.1. Research and Development

Investment in R&D R&D is a prerequisite for many types of innovation, and this typically requires financial investment. Newfoundland and Labrador's R&D spending, as a percentage of GDP, is only half the national average as reflected in Figure 2.1. Achieving national parity would require R&D expenditures as a percentage of GDP to more than double, from $145 million to $300 million annually.

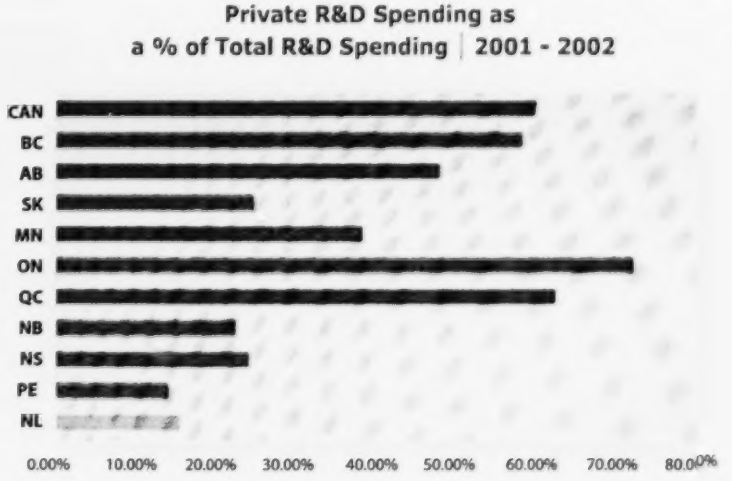
R&D funded by the private sector is important for innovation economies. Businesses are rooted in commercialization and thus have the greatest potential for return on investment. As we can see in Figure 2.2, Newfoundland and Labrador is ranked ninth in the country in total R&D spending as a percentage of GDP.

Figure 2.1 *Source: Statistics Canada*



One of the reasons for these low investment levels is the predominance of small and medium-sized enterprises (SMEs) in the province. More than 95 per cent of businesses in Newfoundland and Labrador employ fewer than 50 people and more than 60 per cent of these have fewer than five employees. Such firms typically have limited resources to invest in R&D and new technology.

Figure 2.2 *Source: Statistics Canada*

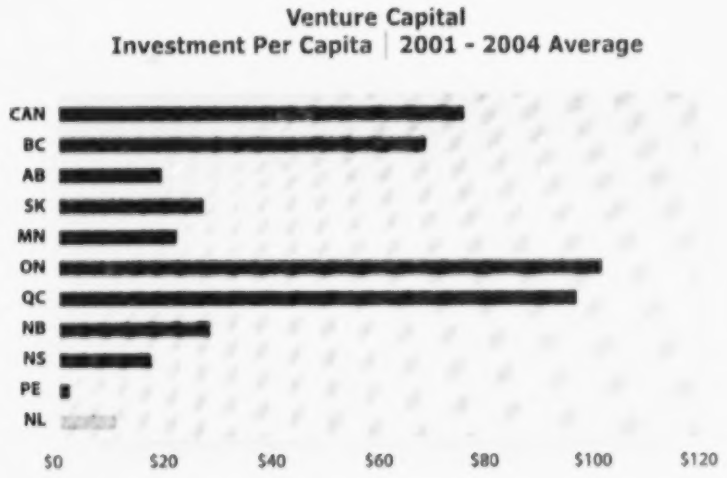


The percentage of people employed in R&D-related activity in 2002 reflected this overall pattern. Newfoundland and Labrador ranked second in Atlantic Canada with 0.6 per cent of the workforce (Nova Scotia ranked first with 0.8 per cent) but we were tied for sixth, with Manitoba and Saskatchewan, when compared to all provinces. The national rate was 1.2 per cent.

A significant amount of our existing R&D expertise was the result of an earlier Federal-Provincial Offshore Development Fund. That fund was instrumental in building capacity, particularly at Memorial University and the Marine Institute. One of our challenges is to continue to maintain and add to that capacity in the absence of a significant influx of similar capital spending.

Resources for Universities and Colleges While Newfoundland and Labrador is recognized for several world-class R&D facilities, these tend to be focused in ocean science and marine technologies. Overall, we tend to lag behind other provinces in R&D expenditures at educational institutions. Total R&D expenditures at MUN and CNA in 2003-04 were $114 million, with the province ranking eighth in the country (see Figure 2.3).

Figure 2.3 *Source: Statistics Canada*



2.3.2. Education

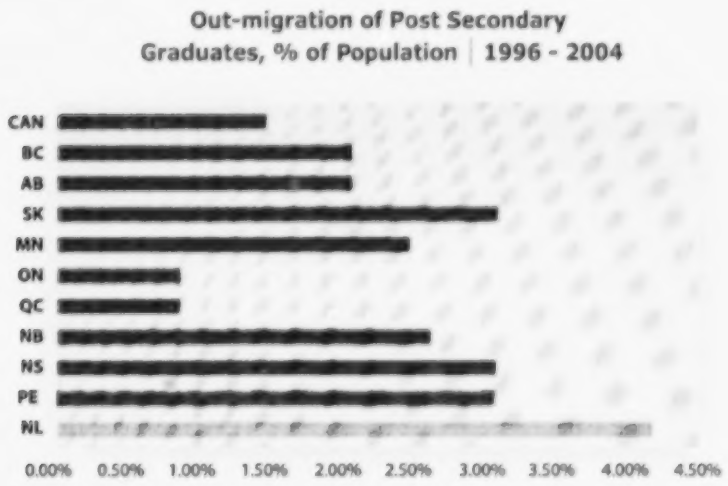
Keeping Pace with Change Smaller businesses, which predominate in this province, often have difficulty keeping pace with change since it is more difficult for their employees to access education and training in innovative technologies. As government's recent *White Paper on Public Post-Secondary Education* (2005) notes, "SMEs face particular challenges for training employees, having limited resources to support employee development and especially because of the impact of lost production time during training. While SMEs typically cannot spare their workers when they are busy, the workers cannot afford training during slow periods."

Highly-Skilled Workers Having workers with special training and skills is a key requirement of competitive, productive firms in industries that utilize advanced technologies, such as manufacturing, scientific, professional and technical services. Only 9.4 per cent of Newfoundland and Labrador firms are in these industries. This is significantly below the 17.0 per cent national average, and ranks eighth among the provinces. This means that there is not enough demand in some areas to justify the training we need to build our workforce.

While the province has made significant gains in these areas in recent years, our labour force is still dominated by a cohort without post-secondary education, and a significant portion with less than high school completion. Even though our post-secondary participation rates have increased, today less than 10 per cent of our population (age 15+) have university degrees, ranking us as the lowest in Canada.

Compounding this challenge, Newfoundland and Labrador has the highest out-migration rate of post-secondary graduates in the country. For the period 1996-2001, 4.2 per cent of our population with post-secondary graduation left the province compared to the national average of 1.5 per cent (Figure 2.4). This has been one of the major challenges to innovation in this province.

Figure 2.4 *Source: Statistics Canada*

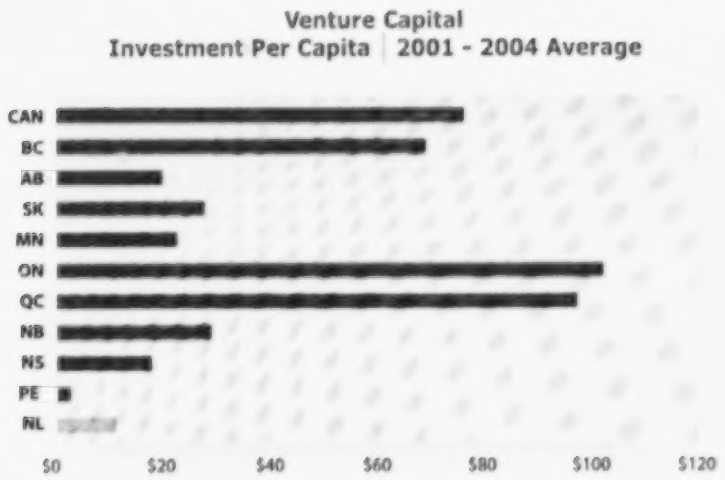


2.3.3. Business Environment

Access to Risk Capital The private sector often requires high-risk capital to move through the R&D stage to commercialization. Venture capital is financing for high-risk business creation and the commercialization of new products. In this province, the use of venture capital is quite limited. As Figure 2.5 indicates, between 2001 and 2004 venture capital investments for Newfoundland and Labrador averaged just over $9 per capita. This was only 12 per cent of the national average of $76 for this period, the second lowest of all the provinces. At those levels, to achieve parity would require more than an eight-fold increase.

Several factors contribute to low use of venture capital in this province. Before putting up capital, investors want to know that the business has sufficiently strong management, marketing and financial skill sets to introduce new products and processes to the marketplace and ensure success.

Figure 2.5 *Source: Thompson McDonald (Venture Capital)*



Note: This figure measures the cumulative venture capital invested over time, capturing the changes that occur from year to year, as opposed to measuring for a single year. This is referred to as the cumulative stock.

Bureaucracy During the consultations for this Innovation Strategy, several stakeholders said that the structure of government can be an impediment to innovation. This includes, for example, how agencies respond to new ways of doing things, onerous regulatory requirements, or programs that are not flexible enough to accommodate innovative concepts. While more may be needed, the provincial government has already begun to address such concerns through initiatives like Red Tape Reduction (RTR) and the re-structuring of the Department of Innovation, Trade and Rural Development (INTRD) to advance innovation in industry. These measures will help ensure that government is an instrumental part of our solutions rather than creating challenges.

Economic Structure and Resource-Based Industries Our resource sectors – mainly primary resource extraction and exports of raw or semi-processed commodities – have long been the backbone of our rural economy. However, resource industries sometimes lag behind knowledge-based enterprises in adopting new technologies. This may be because of the "re-tooling" costs involved, a perception that enterprises will not get a good return on such investments because of uncertainties about the industry, or because business owners are reluctant to change their customary way of doing things. These industries, and others, are scattered throughout the province, primarily in coastal areas that are experiencing rapid demographic change.

In addition, several primary-resource industries, chiefly fisheries and forestry, are facing supply pressures, increased energy costs, an aging public infrastructure, a high Canadian dollar, and competitive pressures from lower cost producers in China, South America and elsewhere.

Since the fishing industry is a cornerstone of our province, we must address its issues if we are to establish a more innovative provincial economy. Newfoundland and Labrador fish products command much lower prices than those obtained by Icelandic, Norwegian and Nova Scotian competitors. To improve our competitive position, it is essential that we improve the quality of the products we produce. This may also require us to review the sustainability of fishing methods, handling practices and overall management. Enhancing this core industry will also stimulate innovation in many other ancillary industries. This is true for the forestry and agriculture industries as well.

Geography and Demographics Some of the greatest challenges for economic development and innovation are due to our geography and population:

we have a small population living in an immense geographic area. Many of our communities are located in remote regions. Our costs of providing infrastructure and services in such areas are high, and the costs of getting products to market can sometimes prevent us from competing successfully.

Overall our population is declining. It is aging and there are significant regional population shifts from smaller communities to larger service centres and other provinces. Smaller and relatively more rural areas are the most impacted in terms of loss of youth and skilled labour. These individuals are emigrating to those towns

and regions that offer high-paying and full-year employment that meets their expectations. The result is that rural regions are increasingly subjected to economic competition and consolidation at the same time their youth and skilled labour are leaving.

Collaboration Knowledge industries thrive in collaborative environments. Too often in this province, businesses, research institutions and communities work in isolation, duplicating effort and resources, or failing to use our sometimes limited infrastructure in the most effective way. We miss the cost and effort efficiencies that could come with stronger linkages and greater cooperation and collaboration, such as those achieved by sharing physical and financial resources and other assets. This includes the sharing of expertise and experience. Greater pooling of effort and assets can lead to cost savings, faster competitive advances and greater levels of success. In this province, particularly in rural areas with fewer assets to go around, we have to share what we have and work more effectively together.

Equitable Opportunity In Newfoundland and Labrador – as in other jurisdictions – many industries associated with innovation have a comparatively low rate of participation by women. These include such key areas as biotechnology, marine technology, information technology and environmental industries. This means we are missing opportunities for drawing on a large and valuable part of our human resource potential. If we are to make use of all our knowledge-sector assets and creative talents, it is essential that both genders have equitable opportunities and take active roles.

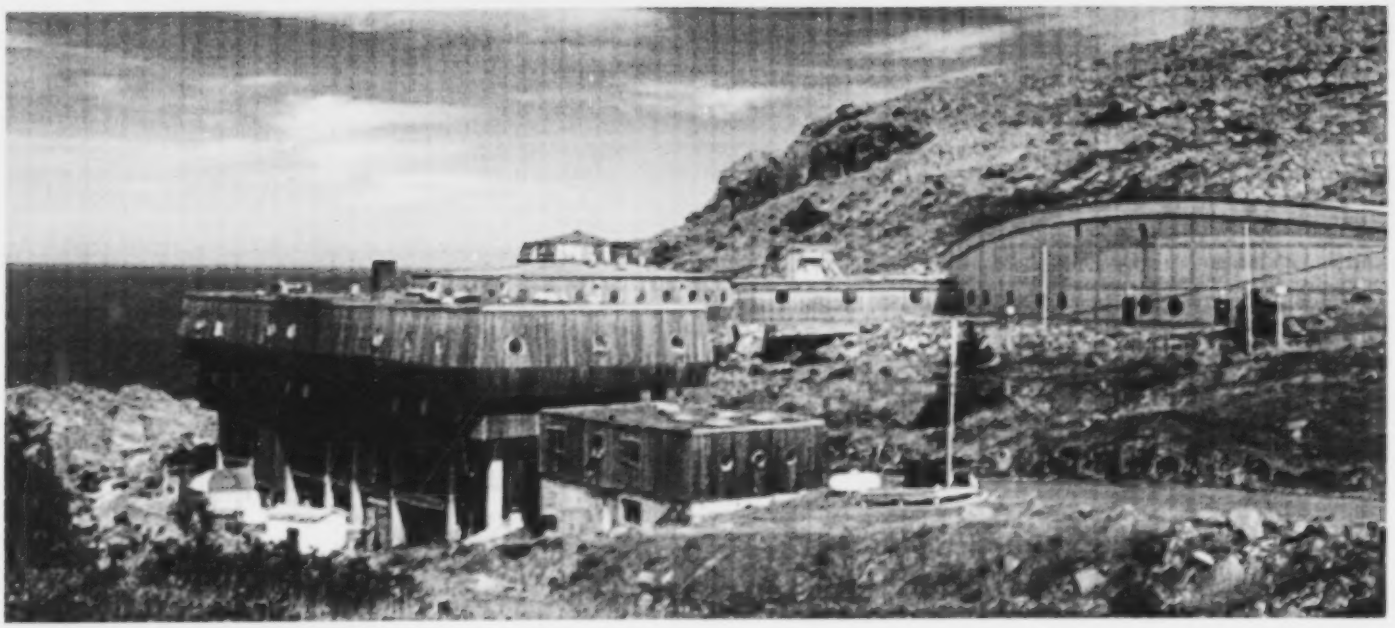
2.4. Using Assets, Addressing Challenges

The assets we have in certain R&D areas, our education system, and our business supports and existing expertise, as well as our culture of adaptation and perseverance, will provide a solid foundation for our Innovation Strategy. This is a good base to build on, but we have to do more with what we have, add more capacity and access more options to achieve the kind of growth we need to catch up and move ahead, as other jurisdictions continue to implement their own plans to become stronger and more innovative competitors.

We also have to meet several challenges. Most of these are not new, but we have to find new ways to overcome them in order to move forward. Collectively, these factors hinder our capacity to be innovative, or to take innovative ideas to the marketplace. This inhibits our capacity to grow new products and industries, and to compete nationally and internationally. These factors can also make it difficult to attract new companies, researchers and experts.

Our challenge in developing an innovation strategy is to find the right mix of support, facilitation, partnerships and strategic interventions for our unique needs and circumstances. Our strategy must be an approach that we can afford and can sustain over the long term. The commitment and participation of all our partners and stakeholders are essential if Newfoundland and Labrador is to meet this challenge.

Government's Model for INNOVATION



3. Government's Model for Innovation

3.1. Our Vision

We envision an innovative Newfoundland and Labrador that fosters and sustains a culture of creative thinking. We will work cooperatively to achieve economic and social gain and create an economy that is ready to compete globally so that our people live in, and contribute to, a more prosperous Newfoundland and Labrador.

In such a culture, new ideas are welcomed and innovators are encouraged, while present skills and expertise are valued, sustained and renewed. In such an economy, all citizens have the opportunity to participate and prosper wherever they live in the province. Newfoundland and Labrador will become a more attractive place for innovative enterprises to locate and flourish, and for people from diverse cultures to live and contribute, where labour, business, academic and training institutions and governments work together to generate new and lasting economic opportunities. Since new ideas and change often involve risk, ours will be a society that encourages and celebrates our risk-takers.

To achieve this vision, certain fundamental elements are required to create the right climate for innovation and the best opportunities for change. An innovation system is the complex set of relationships among people, organizations, institutions and enterprises that drives successful innovation. The system includes businesses, universities, colleges, government research institutions, industry, labour and community organizations. Our cultural, financial and regulatory environment, as well as the skills of our people, are also essential components. All of these elements, directed towards a common purpose, determine overall innovation performance. These are the building blocks of a productive innovation system.

The elements described in the following section are the key components of the innovation system we are aiming to establish. First, there must be an awareness in our *culture* of the value of new ideas and a confidence in our ability to take risks and succeed. We also need the right *financial supports* and the appropriate regulations and policies to increase our capacity for innovation. We need to have the right *physical and information infrastructure* to serve as a foundation for innovators. We need competitive *industry structures* that take advantage of our present strengths and encourage us to develop new ones. We need to be able to identify and capture *market opportunities* for our innovative goods and services. We must ensure that our people have the right *skills and knowledge* to support an innovation economy. And, finally, we must find new and better ways to cooperate and collaborate so that we can work together to compete successfully in the global marketplace.

3.2. Fundamentals of Innovation

3.2.1. A Culture of Innovation

Newfoundlanders and Labradorians are known for their unique culture and their commitment to this province. We are proud of who we are and where we live, and we want the choice of being able to stay here to work and raise families. Our culture also helps to define our attitudes about life and work, our relationships with each other, and how we work together. It influences how we view our own heritage and the way we interact with other cultures.

Canada25, an independent policy analysis organization, defines a culture of innovation as one "where all Canadians feel empowered to constantly find new methods of addressing and improving upon the challenges they face in their particular sphere of life, whether that be scientific research, business, politics, community affairs or any other realm. It also means that Canadians must feel confident that their communities will respect, support and promote ingenuity in its many facets. In short, we believe that Canada must strive to be a community of creative thinkers, one where new ideas and approaches are held in the highest regard" (*A New Magnetic North*, 2001).

An innovation culture requires strong leadership to provide focus and to support enterprises, labour, educational institutions, governments, and industry to contribute to their full potential. To be truly successful, all Newfoundlanders and Labradorians have to be part of the solution. We all have to work together.

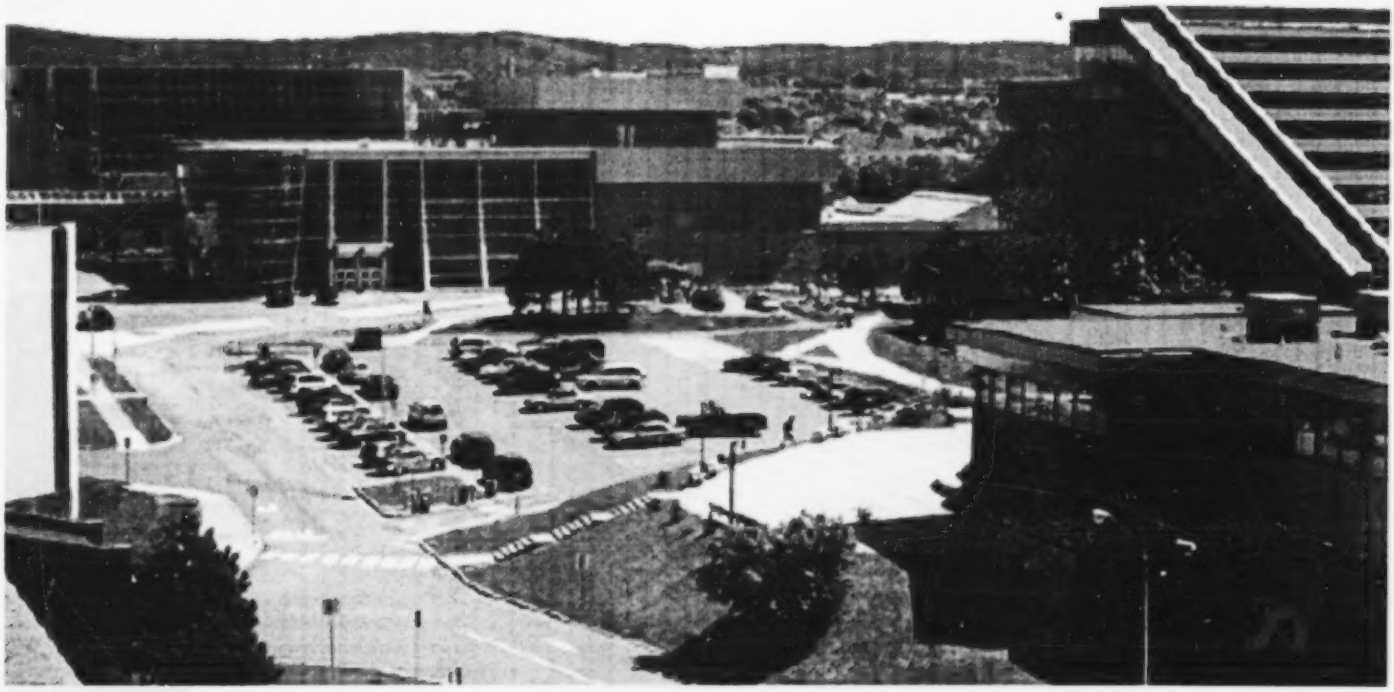
Empowering all citizens also means that our culture must encourage and support women to participate in and contribute to sectors where they are currently under-represented, particularly in technology and innovative industries.

Fostering a "community of creative thinkers" for Newfoundland and Labrador means encouraging and supporting new ideas and new ways of doing things while maintaining the strengths and unique character our own culture provides. As Newfoundlanders and Labradorians we share a strong legacy of ingenuity, resilience and independence. We have had the fortitude and the ability to adapt and survive under challenging circumstances over hundreds of years. A new culture of innovation must reinforce our traditions of perseverance and creativity and our strong entrepreneurial spirit, as well as promote an openness to global perspectives. We must also have confidence that we can be the best and can produce the best, and that we can sell our products, services and ideas to the world.

An innovation culture requires strong leadership to provide focus and to support enterprises, labour, educational institutions, governments and industry to contribute to their full potential. To be truly successful, all Newfoundlanders and Labradorians have to be part of the solution. We all have to work together.

3.2.2. Skills and Knowledge

Our success in achieving an innovation culture and economy depends on our having a skilled and educated population that is prepared to compete and lead in a global society. Knowledge is both the foundation on which new ideas are built and the result of innovative thinking, research and development. It is a prerequisite for innovation and often its product.



In an increasingly technical environment, life-long learning is the only option for employees who are expected to remain up-to-date in a globally competitive world of continuous change. Employees need to be adaptable, versatile and self-reliant. An effective innovation strategy requires an education system that can deliver the knowledge and skills our workforce needs, in a timely manner, to generate new ideas and put them to work. It must also recognize the importance of life-long learning that is accessible and affordable by all our citizens, wherever they live in this province.

An effective strategy must also recognize the value of attracting and retaining highly-qualified people (HQP) from around the world, who bring with them new skills and innovative concepts that can help us become more productive and more competitive.

3.2.3. Industry Structure

Overall, we need to strengthen our resource industries and create new niche industries that extend our economic base. Small enterprises and resource industries are extremely important to our economy, especially in rural areas. Increasing their efficiency and competitiveness will require special focus, such as exploring new approaches to training delivery, R&D and innovative partnerships, particularly through emerging industry clusters within the province, such as our marine technology cluster.

Although they may contain small individual companies, or a large anchor firm and several smaller companies working collaboratively as a network, clusters are able to achieve some of the advantages and efficiencies of larger corporations. By working collectively, SMEs can be more effective when interacting with suppliers, service firms, training institutions and governments. Working together at the commercialization stage, they can be more effective in identifying markets and marketing opportunities. The combined strengths, expertise and experience of the cluster create a competitive advantage for all the participants.

In most instances, clusters work most effectively in specific geographic locations, and tend to form and evolve in or near centres where certain key partners (such as R&D institutions) exist, although they may draw on expertise and strategic alliances from anywhere. Once established, clusters attract other new participants to locate nearby, further adding to diversification and growth. In other situations, depending on the nature of the enterprise or industry, individual participants might be situated in different areas but still work together as an integrated cluster by using technology such as broadband communications.

3.2.4. Financial Supports

Adequate financial supports for businesses, R&D and educational institutions are essential for increasing our capacity for innovation. It is especially important for smaller enterprises. Such supports allow for investment in new ideas and new or better skills, encourage cooperative ventures and help innovative enterprises get off the ground. They can be invested in infrastructure required by innovators to turn their new ideas into new products. Incentives supporting commercialization and marketing assist the progression from the identification of new products to the creation of profitable enterprises and industries.

While financial incentives often require up-front spending by government, they can be excellent investments – increasing R&D, building skills and knowledge, strengthening infrastructure – and result in productive returns for our province. Such incentives also allow funds to be leveraged from other sources.

3.2.5. Regulation and Policy

The Government of Newfoundland and Labrador plays a central role in the province's economy. In addition to providing funding, it sets fiscal policy and taxation regimes, regulates several industries, oversees our public education system, builds and maintains our public skilled trades and infrastructure, and certifies qualifications for many professionals.

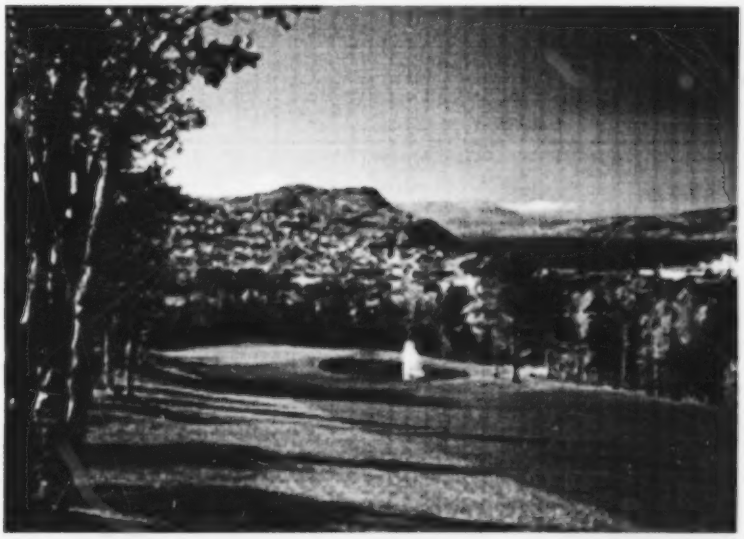
For our Innovation Strategy to work, government must establish adaptable and flexible policies and programs that meet the needs of business and encourage innovation and economic growth. This means striving for greater regulatory efficiency and policies that promote ingenuity instead of holding it back with red tape. This is a central objective of our current Red Tape Reduction (RTR) initiative. Another example is found in the Atlantic Energy Roundtable process, which has helped move the offshore regulatory regime towards a more results-based approach to achieving regulatory compliance. Each of these approaches is an important step toward improving our overall competitiveness.

All levels of government must participate in developing a culture of innovation, and do so with a holistic approach that understands the needs of innovators from the genesis of ideas, through development, to the global marketplace.

3.2.6. Infrastructure

Sound infrastructure is essential for building an innovation economy as well as for supporting our overall quality of life. An efficient and affordable transportation infrastructure allows us to be more competitive; if we want to sell our products and services to the world, we have to be able to get them there, on time and on cost. Efficient communications infrastructure increases the speed and effectiveness of the information we receive and supply.

Other kinds of infrastructure are also essential for an innovation economy, especially infrastructure that supports R&D. This "knowledge infrastructure"



includes everything from specialized research laboratories and testing equipment to ICT and broadband infrastructure, to educational facilities, business incubation centres and investments in emerging technologies.

Skilled and experienced individuals, such as those based in an educational institution or R&D facility, are also critical for supporting innovation and mentoring other innovators. Top-notch experts undertaking cutting-edge research in well-equipped research facilities not only feed directly into our innovation system, but they also attract other experts to come to the province, further

increasing and enhancing our available human resources.

With the right infrastructure, we are better positioned to attract and develop high-growth innovative businesses and industries, and better able to produce, compete for and retain the best experts and innovators.

3.2.7. Market Opportunities

Even with all of the other elements in place, innovative ideas and products will not benefit our economy if there are no buyers. Identifying and creating market opportunities – connecting with those who want the new products and services, and bringing the goods to market – are the true drivers of economic growth. The point of sale is the point at which we, as a society, receive the tangible benefits from the various investments we make in the system.

Clearly, market demand – or potential demand – must exist for any new idea or product if it is to be saleable and become profitable. Commercialization must be part of any innovative economic system and any innovation strategy.

Considerable expenditures of time, money and human resources are required in both commercialization and marketing, and these must be recovered through returns on investment to ensure a long-term sustainable system.

3.2.8. Working Together

Collaboration allows the sharing of costs and risks associated with investments in innovation. It can also increase the speed with which new concepts and products are developed, and produce overall efficiencies in commercialization and marketing. Working in larger partnerships also allows the participants to achieve economies of scale when making investments. The strengthening of industry clusters within the province and its regions will facilitate this process.

Working together allows greater and more diverse resources – infrastructure, human and financial – to be dedicated to solving a particular problem. In the end, more people will benefit from the results. Newfoundland and Labrador's population is similar to a mid-sized Canadian city, but spread out over a vast geographic area. This means our resources

must be deployed strategically if they are to be available to all who need them. Working collectively is the only realistic way of sharing limited resources, overcoming barriers of distance and isolation, and avoiding costly duplication and unproductive competition. Collaboration will ultimately leave more of our resources to invest in new infrastructure and further innovation.

Government has a responsibility to facilitate the efforts of collaborative groups and to encourage partnerships among them, but collaboration is also important for policy and regulatory development to support an innovation environment. Working together, business, labour, R&D and educational institutions, community and business associations, and government make up the best team to guide our Innovation Strategy.

The Newfoundland and Labrador government has made a commitment to develop a provincial innovation-oriented economy. Governments can foster economic development and develop capacity through efficient and effective tax and regulatory regimes, by collaborating with industry, labour and academia to develop and implement economic development plans, by encouraging grass-roots participation, developing mutually-beneficial partnerships, and through facilitating opportunities for highly qualified individuals to conduct R&D.

- Newfoundland and Labrador Association of Technology Industries

3.3. Our Innovation System

The following model, illustrates the relationships between the various elements and entities in the innovation system which will be implemented through government's Innovation Strategy.

The outer circle represents the stakeholders in our Innovation System, and indicates the importance of *collaboration* between and among all these partners who share the goal of advancing our economy through innovation. The second circle shows the fundamental *elements* that support innovation. The centre represents our core objective – *innovation performance:* increased productivity, economic value and social gain. This is achieved through the new ideas, products and services that get to market and get results.

Newfoundland and Labrador

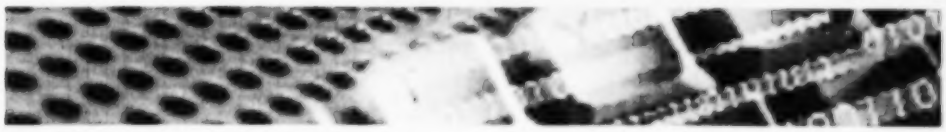
Figure 3.1: *Our Innovation System*

Within this system, trained personnel are able to research and develop new products, processes and services, and work with business and development groups to bring them to market. Labour and professional associations foster networking and partnerships to identify training needs and develop opportunities for growth. They also build consensus and expertise to ensure obstacles are recognized, and efforts are focused in the areas with the highest potential for success. At the same time, government and other stakeholders help to facilitate investment, support infrastructure, enhance skills and market development, ensure a supportive policy environment and work to advance a culture of innovation throughout the province. The result is a higher level of innovation performance and a more prosperous Newfoundland and Labrador.

Newfoundland and Labrador
INNOVATION SYSTEM

Figure 3.1: *Our Innovation System*

Within this system, trained personnel are able to research and develop new products, processes and services, and work with business and development groups to bring them to market. Labour and professional associations foster networking and partnerships to identify training needs and develop opportunities for growth. They also build consensus and expertise to ensure obstacles are recognized, and efforts are focused in the areas with the highest potential for success. At the same time, government and other stakeholders help to facilitate investment, support infrastructure, enhance skills and market development, ensure a supportive policy environment and work to advance a culture of innovation throughout the province. The result is a higher level of innovation performance and a more prosperous Newfoundland and Labrador.



Government's INNOVATION STRATEGY

4. Government's Innovation Strategy

This chapter describes how government will implement its Innovation Strategy and achieve the level of *innovation performance* we need to compete and prosper in the national and international marketplace. It sets out the strategic directions, goals and objectives that will be government's innovation agenda. The following chapter then describes the specific initiatives and actions that will make our innovation system work.

4.1. Four Strategic Directions

Government has identified four strategic directions to focus the province's Innovation Strategy. These directions are designed to build and strengthen the innovation fundamentals, described in Chapter 3, that are required for a strong innovation economy: a strong *culture* of innovation and cooperation with the necessary *skills* and *knowledge*, the right *financial supports*, the supportive *regulations* and *policies*, good *physical* and information infrastructure, appropriate and competitive *industry structures* and the ability to identify and capture *market opportunities* for new or better goods and services. Working with these elements, and *working together*, we will have the capacity we need to compete and succeed in the global marketplace.

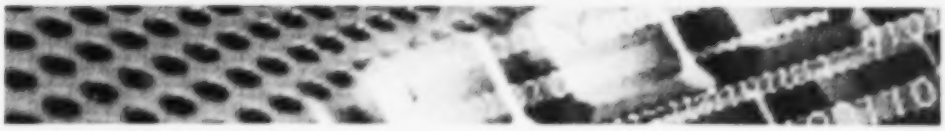
The four strategic directions to focus the Innovation Strategy are:

- **Fostering a culture of innovation that encourages new ideas and collaboration among industry, labour, government, educational institutions and other stakeholders throughout the province.**
- **Positioning Newfoundland and Labrador as a competitive economy with recognized international strengths and advantages.**
- **Broadening education and skills development, and aligning them with the future economic direction and labour market development needs of the province.**
- **Supporting enhanced R&D capacity, and improving financing and investment tools to facilitate commercialization.**

For each of these strategic directions, the following sections set out goals and supporting objectives. They also describe the implications and related issues and the means by which we will achieve these goals and objectives.

Because our goals and objectives are complementary, they support or involve several of the strategic directions in an integrated way. For instance, initiatives to strengthen education and skills development also support our innovation culture, strengthen our competitive position, and contribute to R&D and commercialization across the province. By working together, these initiatives ensure our innovation fundamentals are in place, supporting innovators in all our industries and regions.

The development of new ideas and the creation of new products and services for the marketplace, based on those ideas, are the two fundamental conditions for an effective innovation system and a strong innovation economy.



4.2. Fostering a Culture of Innovation

Goal

Ours will be a culture of innovation that values and promotes the creation, sharing and implementation of new ideas, and enables and sustains collaboration among industry, labour, governments, institutions and other key stakeholders throughout all regions of the province.

Objectives

- To foster a climate where new ideas and innovative solutions are the expected ways of doing business, where risk-takers are celebrated and where global perspectives are actively sought and integrated.
- To position government as a key agent for creating an environment that supports innovation in all our regions, and for ensuring that policies and infrastructure are in place to support innovation.
- To promote collaboration and strategic partnership initiatives and alliances that will support innovation and the development of innovative industries.

The level of awareness of the nature and value of innovation within our culture establishes the baseline for how we think about and respect innovation and innovators. It affects how likely we are to seek innovative solutions or consider and incorporate new ideas. It also influences our attitudes towards risk, collaboration with others, our working relationships, education and development.

A well-established culture of innovation will enable the openness and independent thinking required to be truly creative. It will also help us have confidence in our ability to be the best, to welcome the ideas and experiences of others, and to seek and incorporate global perspectives.

Many initiatives are now under way or in the process of being implemented throughout government that will support and complement our strategy and help build our culture of innovation (several are described in the following chapter). One important initiative that will support this goal is INTRD's Getting the Message Out (GMO) program. It provides concrete examples of business successes and informs audiences about economic development initiatives and entrepreneurial opportunities. Staff deliver dynamic presentations that highlight diverse and innovative businesses around the province, as well as information on growth industries, employability skills, exporting, and the challenges and opportunities in our economy.

Many government initiatives are already reaching out and bringing a positive message about innovation to educational institutions, economic development and business groups, R&D agencies, social and cultural organizations, resource and manufacturing sectors, government departments and agencies, and buyers and suppliers, in both urban and rural areas.

In practice, any activity or program which incorporates or considers the concept of innovation in its mandate or

planning – even if it is not specifically directed towards achieving a goal in the Innovation Strategy – helps to send the message that innovation is important and should be a normal part of the way we do business. This Strategy and the extensive planning and consultation process that preceded it, are themselves important vehicles for new ideas and enhancing our culture of innovation.

The more we incorporate this message – whether directly or implicitly, in all our programs and services – the more it will permeate through society, and the more pervasive and robust our culture of innovation will become.

4.3. Building a More Competitive Newfoundland and Labrador

Goal

Our province will support and attract innovators and entrepreneurs, with improved capacity to compete nationally and internationally, and more efficient and productive enterprises that are widely recognized for their high-quality products, services and expertise.

Objectives

- To strengthen our expertise, skills and capabilities by enhancing access to high-quality education and training, and by attracting individuals who can contribute new ideas, perspectives and knowledge.
- To ensure appropriate and adequate physical, communications and knowledge infrastructure to support innovative industries and to attract and retain new experts, innovators and innovative enterprises.
- To encourage and support new niche industries that extend our economic base.
- To encourage and support opportunities for collaboration among government, R&D and educational institutions, community and business associations, business and labour groups and entrepreneurs, to increase efficiency and productivity.
- To identify and pursue new markets and marketing opportunities, locally, nationally and internationally, and ensure that our goods and services can reach the major markets of the world.

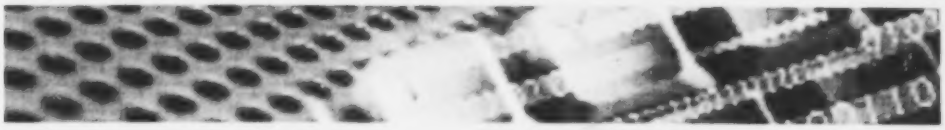
Many factors affect competitiveness, such as workforce skills and expertise, the reliability of transportation and communication systems, the productivity and cost efficiency of enterprises, access to materials, the types of products and target markets, regulatory regimes, financial supports, and the relative strength of competitors.

Competitiveness is not just about cutting costs and – in particular – it is not about reducing wages or cutting spending on services that maintain and improve our standard of living. It is about working smarter and more efficiently, and creating better products and services than the competition's. For instance, the "lean manufacturing" initiative being carried out by CME is helping Atlantic Canadian firms identify more innovative and efficient manufacturing processes and procedures.

Ensuring that innovators and others in our workforce have the right skills, knowledge and expertise to be competitive is essential. Many opportunities for us to be innovative and to compete nationally and internationally will arise in knowledge-based industries. To become more competitive we will need to strengthen our current knowledge and expertise base, including educating and training new workforce participants, and keep our existing workforce up-to-date. Our post-secondary education and training system is already moving forward through its *White Paper on Public Post-Secondary Education* initiatives (described in the following section and Appendix) to support and enhance our existing knowledge infrastructure and to attract new expertise. It also helps to address issues of greater collaboration and cooperation within and across educational and R&D institutions.

When complete, our new Immigration Policy, supported by programs such as the Provincial Nominee Program (PNP) which recruits immigrants who have specialized skills, will work to attract, integrate and retain new expertise to the province.

World-class physical, communications and knowledge infrastructure are vital for creating and sustaining an innovation economy as well as for attracting and retaining experts and innovators. To date, the province has made significant progress establishing a critical mass of these infrastructures through direct investments and by leveraging federal sources. Improved broadband infrastructure for government and for rural and northern areas, for example, will strengthen critical communications infrastructure, and an expanded IRIF program will provide and leverage further investment in research and innovation infrastructure at our public research institutions.



New industries that capitalize on our natural assets and capabilities are essential for extending our economic base throughout the province. Strategic exploitation of our marine sector, energy resources and environmental expertise has attracted a wealth of human and financial resources. This Innovation Strategy provides opportunities to build on existing human, financial and structural resources in ways that will support innovation and innovators. Government's current comprehensive energy policy review will assist us in taking strategic advantage of the province's natural abundance of hydro-electricity, petroleum, and alternative energy sources.

To strengthen our success in the marketplace, and to identify new markets where we can compete, new investments are needed to capture new marketing opportunities, especially those beyond our borders.

Within the province, INTRD's Supplier Development initiative is strengthening the relationship between public sector purchasing agents and private sector groups to facilitate the development of our local supplier community and create new local market opportunities.

Internationally, for example, government's Ambassador Program has identified friends of the province ("ambassadors") who promote Newfoundland and Labrador to the world. Located around the world, these ambassadors work to promote the province, allowing us direct access to potentially valuable market information and an expanded business network in foreign markets.

4.4. Strengthening Education and Skills Development

Goal

Our education and skills development system will utilize its broad geographic resources and infrastructure, and its expertise in innovative program delivery, to prepare Newfoundlanders and Labradorians to collaborate, compete and succeed as innovators in the global economy.

Objectives

- To increase our capacity to support innovation by providing appropriate, accessible and affordable education and training.
- To increase collaboration through partnerships among post-secondary educational institutions, business and labour in key industry sectors.
- To ensure a sustainable education and training system that meets the needs of the present and future social and economic directions of the province.
- To retain our skilled workers, especially our young people, so that they can employ their creativity, expertise and knowledge in their home province, strengthening our innovation capacity, our economy and the future of our society.

The Government of Newfoundland and Labrador is dedicated to building a strong foundation to enable the province to achieve its greatest potential. A critical component of this foundation is an educated population and workforce with the knowledge and skills to meet today's challenges and to create tomorrow's opportunities.

The creativity, skills and research capacity developed through our higher education systems are essential for achieving prosperity and moving us forward as an economy and as a society. As we increase our efforts both to meet the demands of the knowledge-based economy and to ensure the continued competitiveness in traditional economic sectors, our workforce will face increasing demands for new and more specialized skill sets, and these will increasingly require more post-secondary training. There is a strong connection between higher education and skill levels, and innovation, productivity and higher earnings. Having a highly-trained workforce also helps to attract investment from both local and outside sources.

It is also essential for us to work to ensure that more of our younger people are able and willing to stay in Newfoundland and Labrador, so that they can contribute their ideas, their energy and their skills to our economy and our society. The province's future depends in so many ways on their contribution. The better we become at building good opportunities for young talent, the more likely they are to stay; at the same time, the more who stay, the stronger our innovation system will become.

Making the most of our human capital also means ensuring that women have equitable educational opportunities so that they can participate in innovative industries, particularly in technology-based sectors where they have often been under-represented in the past.

Greater collaboration and stronger partnerships among our post-secondary institutions will increase efficiencies as well as the overall effectiveness and reach of our system. Stronger links between our postsecondary institutions, business and labour, will help ensure that we are ready to meet our future skills requirements and provide more opportunities for strategic alliances, particularly for R&D.

Considering our relatively small population and economy, and the vast geographical area our educational institutions serve, we must ensure that our system is sustainable as we move forward. This means that we must identify and employ the most cost-effective strategies possible while ensuring that our system meets our present and future needs and serves all our people. These strategies include better collaboration, stronger partnerships, sharing of resources, system-wide accountability, and the application of innovative approaches and technologies. Developed concurrently with this Innovation Strategy, the *White Paper on Public Post-Secondary Education* addresses many of our objectives related to education and skills development. The White Paper recognizes the importance of implementing an integrated system-wide approach to our present and future education and skills requirements.

4.5. Supporting and Expanding R&D and Commercialization

Goal

Our research, development and commercialization capacity will be enhanced throughout the province, using improved financing and investment tools, and stronger strategic partnerships.

Objectives

- To expand R&D capacity in strategic sectors, and in particular to address the recognized gaps in applied R&D and commercialization activities.
- To support market development of new products and processes through business expertise and capital investment.
- To develop and enhance investment tools that advance business growth and support long-term, sustainable innovation and development.

Research and development are critical components of any innovation system. These activities find better and more economical ways of doing things, identify new ideas and determine their feasibility. Commercialization is about taking new ideas and prototypes and turning them into products that people are willing and able to pay for. Without the R&D stage we would not have viable ideas; without the commercialization stage, we would not have saleable products that generate wealth. Together, research, development and commercialization bring the knowledge and know-how to turn new concepts into new commodities, and, eventually, into new industries. Several government initiatives already in progress will

help to expand our R&D capacity and strengthen our capacity at the commercialization stage. So, too, will this Strategy's overall emphasis on collaboration and partnerships, whether among institutions, between education and industry, or within strategic clusters throughout our regions. However, funding must also be available to help ensure innovators in this province have the financial support they need to take their ideas to the next stage.

Government recognizes that there are different requirements at various stages in the progression from new ideas to new businesses and industries. A number of sources already exist to fund basic and applied research, such as the Canada Foundation for Innovation (CFI), the Natural Sciences and Engineering Research Council of Canada (NSERC), the Social Sciences and Humanities Research Council of Canada (SSHRC), the Canadian Institutes of Health Research (CIHR), Petroleum Research Atlantic Canada (PRAC) and AIF, as well as agencies to provide technology advice and support to SMEs at all stages of the innovation process, to build their innovation capacity (such as NRC-IRAP). For university-based R&D, the newly implemented Springboard Atlantic initiative will provided much-needed support for the commercialization stage in the form of expertise, its Patent and Legal Fund and its Proof-of-Concept Fund.

However, many organizations and businesses have expressed a need for further assistance to bring innovative products, processes and services successfully and profitably to market. It is during the commercialization phase that the only funding sources available are likely to be banking and business-oriented (e.g. through CBDCs and ACOA). Often, this is also the time when many companies have little or no remaining internal financial resources, having spent much of their capital in the R&D stage.

Progress in this area to date includes the strategic use of IRIF which enhances research and industrial innovation within higher education and public research institutions (MUN and CNA). *The White Paper on Public Post-Secondary Education* announced a significant increase in the funding of IRIF, which has a three-year forecasted budget of $22.5 million.

In addition, government has implemented a revolving fund to support SMEs. Funding is provided on start-up, growth or expansion to help these businesses create and retain sustainable employment. The fund targets strategic growth sectors such as manufacturing, value-added production, ICT and tourism.

Government has also established a $5 million annual Regional/Sectoral Diversification Fund to address funding gaps within sector organizations, economic development groups and community-based organizations. This leveraging fund is designed for initiatives that address regional and sectoral development, diversification and innovation.

Strengthening linkages between public research institutions and companies that can move research from the laboratory into the marketplace also requires investment. Universities and colleges require assistance to help identify promising research and help them to become investor-ready. Institutions and SMEs need seed capital assistance to help commercialize the best ideas.

This would enable world-class research capabilities to create spin-off companies and accelerate the growth of small and medium-sized enterprises and leading-edge jobs.

Other programs, such as the Embedded Entrepreneur Initiative of NRC-IOT, provide entrepreneurship and managerial guidance for ocean-industry businesses to work with researchers focusing on strategic areas, helping to bring industry-relevant ideas from concept to prototype.

To support aquaculture, government is in consultation with the other provincial governments and the federal government through the Canadian Council of Fisheries and Aquaculture Ministers to develop mechanisms to support the commercialization cycle and assist the aquaculture industry to bring more species and technologies from research through to commercial operation.

The ability to leverage other funding is critical. For example, the province's original $5 million IRIF investment has already leveraged an additional $30 million from federal granting agencies by working collaboratively on a wide range of projects. This is a five-to-one return on our investment. Advocating for an increased level of federal funding and providing a provincial source to leverage this commitment supports both our national and provincial objectives of improving our position in the global environment.

IMPLEMENTING The STRATEGY

5. Implementing the Strategy

This chapter outlines our action plan. It describes the specific steps we will take to reach our goals in partnership with other stakeholders and the people of this province. These actions include both new initiatives and several actions that are already in progress. Together, they will build on our blueprint for success.

5.1. Actions at Work

Government has been building the groundwork for its Innovation Strategy over the past two years. The importance of innovation for our economy was recognized in this Administration's Blue Book in 2003, and several important steps have already been taken to provide a foundation for our other actions to move this agenda forward.

The Innovation Strategy now brings a broader vision and a framework for building a strong and vibrant innovation system.

The Innovation Strategy now brings a broader vision and a framework for integrating these initiatives, ensuring that they work more effectively together, and in concert with other actions, building a strong and vibrant innovation system.

Of particular importance is the restructuring and refocusing of the lead department for the Innovation Strategy. In February 2004, government's economic development department was renamed the Department of Innovation, Trade and Rural Development (INTRD) to reflect the enhanced emphasis placed on innovation in the provincial economic agenda. A new Assistant Deputy Minister, who also serves as the province's Chief Innovation Officer, was appointed to head up a new Innovation, Research and Advanced Technologies Branch. One of this Branch's priorities has been to lead the development of this Strategy and its implementation.

Another major initiative is government's IRIF which aims to enhance research and industrial innovation within higher education and public research institutions. The fund was created to fill a critical void in accessing matching funds necessary to leverage and secure funding from other granting agencies, particularly from federal programs. Recent funding increases for IRIF expand the program and demonstrate government's commitment.

Released in March 2005, government's Comprehensive Regional Diversification Strategy (CRDS) identifies priorities for promoting diversification and sustainable development throughout the province's regions. One of the guiding principles of CRDS is to emphasize innovation and technology as the cornerstones for industrial development. The Strategy is supported through a Regional/Sectoral Diversification Fund contributing to long-term sustainable employment and the growth of SMEs in every region, and a Small and Medium-Sized Enterprise Fund to help finance small and medium-sized businesses.

Other supporting initiatives include:

- Government's broadband initiative launched in November 2005 to review government telecommunications needs and help create a province-wide advanced computer network, a key component of our innovation infrastructure.
- The Marine Technology Development Strategy (MTDS), announced in November 2004 with an initial five-year investment of $1.5 million to support marine technology development strategy for the province.
- Nearshore Atlantic, launched in December 2004 as a partnership between government, Aliant, and Nati with a mandate to attract new technology companies to the province to conduct software-related work for international markets.
- The Centre for Environmental Excellence (CEE), a partnership among business, government and centres of higher education announced in January

2005, based at Sir Wilfred Grenfell College and CNA. CEE aims to expand existing R&D, educational capacity and commercial activities in environmental and social sciences and technical programs in the Corner Brook area.

- The Ireland Business Partnerships (IBP), expanded and re-focused in 2005, is a partnership between the private sector and the Government of Newfoundland and Labrador with a mandate to identify, foster and promote trade and partnership opportunities in business, education and culture with the Republic of Ireland.

- The New England Trade and Investment Initiative uses an innovative business-to-business approach to trade development, whereby the trade team works one-on-one with Newfoundland and Labrador companies over an extended period to ensure their market entry strategy for New England is a success. The investment team communicates with New England companies to educate them about the province and to encourage joint ventures and/or new business opportunities. Many strategic initiatives have resulted, including three Memoranda of Understanding (MOU) signed in January 2006, focusing on the joint advancement of economic strategies related to ocean and marine science and technology in both regions.

- The Strategic Partnership Initiative (SPI), provides the means for improving communications and identifying opportunities for collaboration among business, labour and government on critical issues related to the competitiveness of the province, with a current focus on: labour market development, investment capital, taxation and industrial relations.

A further government initiative has been the establishment of a new Department of Business in May 2004. Led by the Premier, it is taking a principal role in attracting new and innovative businesses and investment to the province. In collaboration with INTRD, the Department of Business works to build a more competitive economy driven by private-sector firms operating in all regions of the province. To date, key initiatives have included the establishment of its Business Advisory Board and the Red Tape Reduction initiative, which is eliminating unnecessary bureaucratic and regulatory hurdles which hinder economic development or investment in the province.

Further complementary actions now in progress include:

- The establishment of a Rural Secretariat to advance rural interests and effectively link economic, social, cultural and environmental issues;
- The creation of the Office of the Chief Information Officer (OCIO), which is responsible for streamlining and enhancing information technology service delivery, reforming management and operational practices throughout government and bridging the role of government in public service delivery with the private sector;
- The development of a Strategic Cultural Plan to promote our heritage and cultural industries;
- The recently released White Paper on Public Post-Secondary Education, which strongly emphasizes the importance of the post-secondary system for the future social and economic development of the province, and for building stronger institutional links to innovation and economic development;
- A branding campaign to highlight our strengths and competitive advantages, including our capacity to support innovation;
- A new Immigration initiative to attract highly-qualified individuals from around the world who can help us become more innovative and better able to compete in the global marketplace; and
- A comprehensive policy review and strategic planning process for the province's energy sector has begun with the release of a discussion paper in November 2005.

The Appendix of this document describes these initiatives and others in more detail and indicates how they support our overall innovation system.

5.2. New Actions

In addition to the initiatives already at work, our Strategy requires new actions to accomplish our goals and objectives. These will work in conjunction with the various programs and plans already under way as we implement the Innovation Strategy.

The actions are designed to support both innovation and commercialization. As stated throughout this Strategy document, an innovation economy requires two principal elements: the creation of new ideas and concepts (based on a strong culture of innovation, good R&D and expertise, and solid infrastructure) and, flowing from these ideas, the development of innovative products and services that create wealth.

Creating and applying the most innovative ideas require us to use all our human potential. As women continue to be under-represented in innovation and technology industries, consideration will be given to ensure women share equitably in creating and benefiting from the social and economic opportunities of this province. In developing the details of these program areas, we will undertake gender-based analysis to determine the level of supports required to increase women's participation in these sectors.

5.2.1. Supporting Commercialization

Commercialization Program A new commercialization fund will support product and service commercialization. As new technology develops from prototype to the full demonstration stage, there is often a substantial drop in the number of funding sources available to enterprises. This fund will expand an enterprise's options and the probability of transforming a new idea into a new commercial product.

The large gap between discoveries and the marketplace requires us to apply new initiatives. Start-up companies require financial supports, mentoring, encouragement to partner and technology transfer assistance. The fund will assist commercialization initiatives with a goal of leveraging matching funding from a variety of sources, such as loans, equity, grants and funds from the private sector and academic institutions. It will support innovative projects that work with private-sector expertise and resources, build links between institutions and the private sector, and support initiatives that help bridge the gap between research and commercialization.

The program will focus on assisting businesses that demonstrate strong potential and a viable opportunity for market acceptance related to an innovative product, process or idea. Applicants will have to demonstrate the benefits to Newfoundland and Labrador.

Companies will likely require patient equity to help commercialize best ideas. This will enable world-class research capabilities, both public and private, to create spin-off companies and accelerate the growth of small and medium-sized enterprises and leading-edge job growth.

The fund will support innovative projects that:

- Enhance private-sector expertise and resources;
- Build links between institutions and the private sector to move products and services forward;
- Bridge the gap between research and commercialization;
- Contribute to an entrepreneurial culture; and
- Link small and medium-sized businesses with researchers, business expertise and other sources of capital.

In addition to general commercialization support, which will represent the primary use of funds within this program, specific initiatives have also been identified, including protection of intellectual property (IP) and technology transfer support.

IP protection funding would assist incorporated entities to protect their often substantial investments in the development of new products, processes and services while they move to marketability and profit generation. Technology transfer support will bring together two or more businesses that have independent and proven operations to advance the partnership beyond what could be achieved individually.

Technology transfer will also be fostered through networking opportunities that link entrepreneurs, technology brokers and technology transfer centres to those with knowledge and information about local markets, partnering potential, and sources of financing. National and international connections will be nurtured by linkages with stakeholders and project collaboration. The program will assist growth by linking small and medium-sized businesses with researchers, business and commercialization expertise, and venture capital.

5.2.2. Enhancing Innovation

Implementing our strategy, and achieving our vision, must be an evolving and dynamic process in which government and stakeholders continue to seek the most effective approaches, matched with the necessary resources to achieve our goals.

Innovation Enhancement Program

A new innovation enhancement program will provide support for public sector institutions, not-for-profit groups, community organizations and industry associations involved in activities that will enhance the innovative capacity, efficiency and effectiveness of the province.

R&D in the province has been increasing and this trend must be further supported. Increasing R&D at the institutional level will help achieve the goal of recruitment and retention of highly-qualified people (HQP), and contribute to the number of "spin-off" companies that are incubated at education institutions. These new businesses offer potential for growth in employment and research opportunities for students and new graduates.

Applied research must also be given a greater priority. Technology centres, prototyping and test facilities help determine the viability of tangible products and processes. Identifying those with a greater chance of market success will assist with attaining more traditional financing sources and capital attraction to move them beyond the institutional level and into private enterprise.

Support for Strategic Clusters The development and expansion of strategic clusters is an effective way of stimulating new ideas and creating new opportunities for all participants. Collaboration and cooperation can also reduce costs, increase efficiencies and capabilities, and enhance competitiveness. The goal is to increase the number of high-value jobs and strengthen our industrial base, aid in research and development, and bring home-grown efficient solutions to market.

New opportunities for effective clusters are opening up in a range of disciplines, such as marine technology, environmental technology, information technology, life sciences, and cultural and tourism industries. For example, in marine and ocean technology, government will support the continued growth of clusters that provide flexible services and resources to assist members to evolve into multi-service companies offering a variety of products and services in the sector. For environmental industry clusters, government will explore options for viable, affordable, long-term and environmentally-friendly technologies and resource utilization, ensuring best practice in using our varied resources, and the responsible monitoring of regional implications.

Technology Parks encourage the transfer of technology from universities and colleges to the marketplace, foster close interaction between businesses located in the park and the public sector (including institutions and related spin-offs if they are nearby), nurture start-up and emerging technologies, and promote economic development. The ability to locate in close proximity to like-minded companies fosters interaction. The ability to operate within such a setting can also be complementary to the image companies wish to portray. For example, the establishment of a Marine and Ocean Technology Park would facilitate collaboration among existing and emerging local companies beyond the incubation stage to build capacity for the industry.

While it is recognized that some clusters may take a long time and considerable investment to grow and become successful, they can become strong and sustainable anchor industries and provide stable employment in communities and regions.

Innovation Awards Government will create awards to recognize the importance of strategic risk-taking and celebrate the success of risk-takers who achieve innovative solutions. The need to recognize and celebrate our risk-takers was a recurring theme throughout the consultation process for this Strategy. The awards will increase awareness of opportunities in entrepreneurship, innovation and technology and will offer ways to recognize individuals who provide ideas to advance science, enterprise and innovative approaches to community development.

Federal-Provincial Innovation Team

Government will propose the creation of a Federal-Provincial Innovation Team to foster collaborative R&D, technology transfer, and commercialization linkages among governments, universities, colleges, research organizations and the private sector, and to review federal and provincial policies and programs.

One such initiative would investigate the feasibility of establishing a provincial research organization to support

R&D and help identify broad issues that impact the success and level of R&D and innovative growth within the province. Discussions with stakeholders should provide a realistic view of the mechanisms required and identify the financial commitment necessary for effective operation.

Support for Youth Innovation Recognizing that an innovation culture has to be grown among youth to be truly effective, government will incorporate the concepts of innovation and entrepreneurship in the school curriculum at the Grade 7-9 level. Since 1992, many high schools have offered a range of courses in the area of enterprise education. For some courses, the provincial enrolment has been as high as 3,500 students. Students actively learn the merits of entrepreneurship, self-employment or skilled trades as viable career choices. Introducing these concepts, encouraging innovative thinking and teaching the value of innovation at an earlier age, in collaboration with the GMO program, will open students up to new ideas and strengthen concepts of innovation and collaborative problem solving in our society. This initiative may also require some additional support for teachers involved in these areas.

Scholarship Fund Government will establish an innovation scholarship and bursary program at Memorial University of Newfoundland, its institutions and College of the North Atlantic for students who demonstrate merit and wish to continue their education or gain additional R&D experience. This program will be open to all fields where innovative methodologies can be demonstrated and focuses support for resident students, increasing the level of retention and training of the province's highly-qualified people.

Graduate Employment Incentive To create more opportunities for new graduates to remain in and contribute to this province, government will enhance graduate employment incentives. It will encourage and support Newfoundland and Labrador businesses to employ our skilled people here, in the province, especially in R&D related activities or in innovative and emerging sectors. The incentive will complement the existing Graduate Employment Program operated by the Department of Human Resources, Labour and Employment.

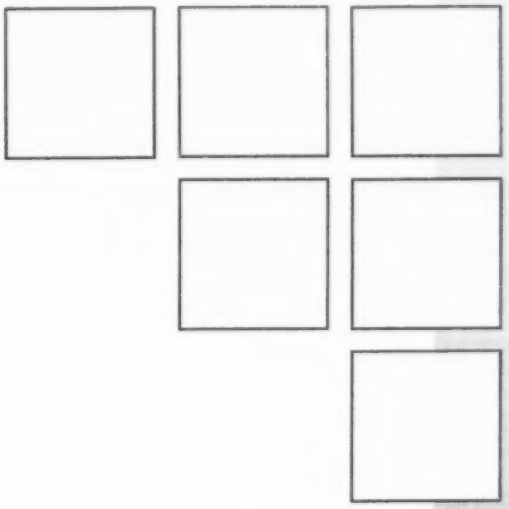
R&D Incentive Information Government will increase communications with the business community to inform them of the various R&D incentives and supports available for businesses in Newfoundland and Labrador, and how to access these supports. This will include information about what constitutes R&D investment and which investments may be eligible.

Advisory Council on Innovation Government will establish a Council to provide advice on future policy and priorities as they relate specifically to improving our culture of innovation. This Council will be composed of people who are themselves innovators and who are committed to innovation as a means of economic and social development. It will have representatives from the innovation community who possess a good combination of technical and professional expertise. They will be chosen to represent a cross-section of interests and perspectives.

Input from the Advisory Council will broaden the scope of information available for the decision-making process to help address issues that will have an impact on innovation performance. Although advisory in nature, the Council will make recommendations that will provide vital information to government as it sets future policies and priorities.

These new and current initiatives are the starting points for creating a truly innovative culture and economy. Implementing our strategy – and achieving our vision – must be an evolving and dynamic process in which government and stakeholders continue to seek the most effective approaches, matched with the necessary resources to achieve our goals. To this end, this strategy sets a framework that allows input from stakeholders for continued analysis on strategic clustering, R&D focus areas and priorities for sector development. Through this strategy, government will also continue to undertake policy and program analysis to ensure the most appropriate and effective allocation of its resources.

MEASURING Our PROGRESS



6. Measuring our Progress

Measuring the progress of our Innovation Strategy will take place on two fronts. The first consists of an accountability framework to track and report the activities and impacts of the major initiatives and funding programs which are part of this Strategy. The accountability framework for the Innovation Strategy reiterates government's commitment to public transparency and accountability.

The second front will track the performance of several macro-level indicators that both reflect and impact on our innovation capacity. These indicators identify objectively our strengths and challenges and provide benchmarks by which jurisdictional differences and changes can be observed over time. These measures will thus allow an analysis of the change in the province's innovative capacity over the long term. The chosen indicators, outlined below, fall into four broad categories: investment, knowledge base, productivity/competitiveness and other innovation capacity measures. Together, they consider a broad view of Newfoundland and Labrador's innovation capacity and innovation-related activities; they are also directly related to the overarching long-term provincial goals set out in this Strategy (Chapter 4).

6.1. Accountability Framework

An accountability framework encompasses a broad range of related components, including performance-based planning, monitoring, reporting and feedback about the strategy. It is supported by specific guidelines and policies to ensure public transparency and accountability to the citizens of the province. It also typically considers its operation with respect to the legislative and strategic directions of government.

The accountability framework for the Innovation Strategy will act as a tool for enhancing governance, planning, monitoring and reporting related to the Strategy, and will encourage evidence-based decision making. It will provide reliable, timely, objective and relevant information by which we can monitor the performance of the Strategy and ensure that the programs and other initiatives are meeting their objectives at the program level. It will also monitor fair gender distribution and determine where modifications are necessary.

The framework details for the Strategy will be developed as the specific guidelines and criteria are established for the two new funding programs.

6.2. Macro-level Indicators

6.2.1. Investment

Investment is one of the most important drivers of innovation activity. Investments in research and in physical and human capital are required if the provincial economy is to achieve and maintain a competitive position in innovation-based industries. This document discusses several measures which reflect various aspects of investment activity, including investment in R&D, new technologies and infrastructure, and venture capital.

Investment in R&D is critical for knowledge development, and the ability to generate, distribute and exploit knowledge is critical to an innovative culture. Business-funded R&D, in particular, is essential to economic development as it is concentrated in activities with commercial applications and significant potential return on investment.

Machinery and equipment (M&E) investment is highly correlated with productivity growth and innovation. M&E investment facilitates the adoption of technology and best practices that are associated with the new equipment. In its summary of trends in Canadian productivity, the Bank of Canada lists investment in M&E as one of the three most important factors affecting growth.

Industry structure also plays an important role in innovation. Literature reviews indicate that, unlike the more traditional industries, investment in manufacturing and professional services is most active in those economies that demonstrate efficiency, productivity and return on investment, all indicative of innovative activity. These industries tend to be users of advanced technology and require skilled labour.

Venture capital is available in most jurisdictions as a form of financing for new high-risk business creation and the commercialization of new products. It is often provided to new or existing firms which exhibit potential for above-average growth. While all forms of investment are vital for business growth, venture capital, in particular, plays a key role in the success of smaller companies in the most innovative and promising business sectors.

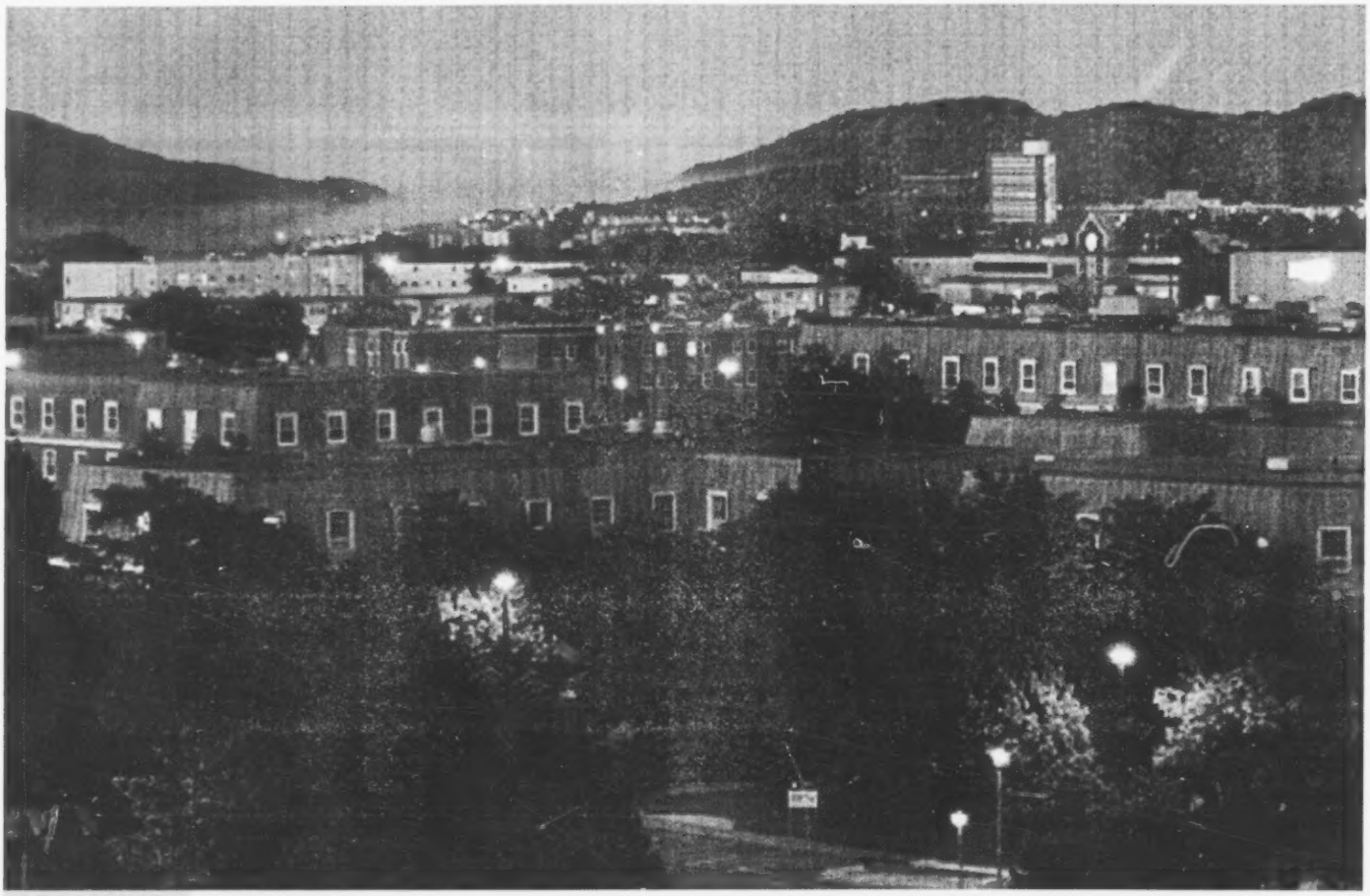
As measures of investment activity, we will consider:

- R&D expenditures per capita;
- R&D expenditures as a percent of GDP;
- private-sector R&D as a share of total R&D;
- Newfoundland and Labrador's share of federal R&D funding;
- use of SR&ED tax credit;
- total capital investment in manufacturing and professional-services industries;
- capital investment in machinery and equipment by manufacturing and professional-services industries;
- capital investment in machinery and equipment by private-sector industries; and
- venture-capital investment per capita.

6.2.2. Knowledge Base

An educated population and a highly-skilled workforce are key strengths in a global, innovation-driven economy. Lower labour cost is no longer sufficient to attract investment. Any competitive edge gained by the introduction of new technology will be short-lived if the workforce is not competitive. Innovation-driven economies are characterized by employment growth in occupations that require both advanced numeracy and literacy skills as well as other specialized skill sets. In particular, technological advancement, globalization and the shift from manufacturing to knowledge-based and information-intensive industries have precipitated changes in the skills required to succeed.

While the post-secondary enrolment rate in Newfoundland and Labrador is high compared to other provinces, the out-migration rate of post-secondary graduates from this province is also high. Out-migration combined with low birth rates have resulted in a declining and aging population; over the next 15 years, 39 per cent of the labour force will be in a position to retire. To achieve global competitiveness and to compete in an innovation-driven economy, Newfoundland and Labrador must strengthen and expand its knowledge base by attracting expertise from other areas, encouraging continuous employer-driven investment in job training and skills upgrading, and encouraging higher enrolment and



graduation rates for post-secondary institutions, all while facilitating the development of an economy that will, in the long term, retain the talents and expertise we have.

This report examines several measures reflecting various aspects of our knowledge base, including post-secondary enrolment, education levels, student assessment, in-migration and out-migration, and employer-sponsored training.

As measures of our knowledge base, we will consider:

- the percentage of population with a university degree or college diploma;
- rate of post-secondary graduation;
- percentage of the working age population (ages 15+) with a university degree or above;
- Programme for International Student Assessment (PISA) scores – in reading, science mathematics;
- in-migration and out-migration by education / skill set;
- participation in employer-supported formal job-related training; and
- share of employment in natural and applied science and related occupations.

6.2.3. Productivity and Competitiveness

The context in which we compete is characterized by increased globalization of economic activity, improved ICT infrastructure, the removal of trade barriers and increased mobility of capital. In this environment, if our firms are able to increase production and reach more markets, we can assume they are competitive in an innovative, global environment. This Strategy examines several measures reflecting various aspects of productivity and competitiveness, including exports, the development of new or improved products or services, and productivity.

Increased production and commercialization of new goods and services (measured by the number of patents filed) is vital to innovation. The patent system itself plays a major role in the transfer of technology by encouraging research into alternative solutions and promoting the dissemination of new technologies. In this way, patents indicate the level of innovative activity in an economy and are a motivating force for technical progress. The subsequent export of these goods and services is a key driver of economic growth. Export growth leads to new opportunities for investment, and increases production and employment levels. Exports also facilitate technology transfer and promote best practices.

Productivity measures indicate how efficiently inputs are transformed into goods and services and are therefore a reflection of increased investment and technology transfer. Productivity growth is also necessary to expanding production, enhancing competitiveness and gaining market share. For firms in highly-competitive markets, productivity gains are crucial, and firms that do not pursue such gains are unlikely to survive in the long term.

We consider two measures of productivity in this report. Labour productivity is the most widely used measure of productivity. Multi-factor productivity (MFP) is a ratio of the amount of output produced by both labour and capital inputs. It is the more relevant measure in assessing how efficiently all factors of production are utilized since it considers the contribution of more than one input.

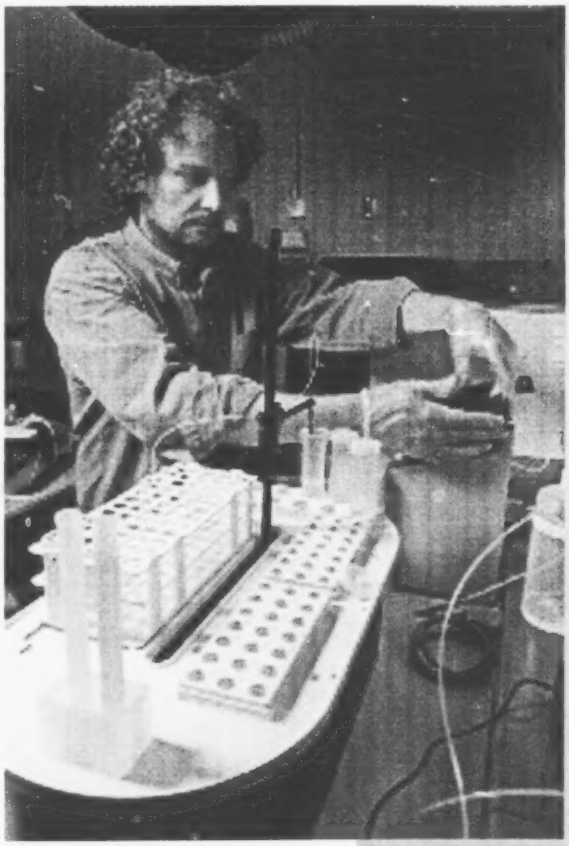
As measures of productivity and competitiveness, we will consider:

- value of exports as a share of GDP;
- proportion of non-resource-based exports;
- number of new patent applications filed;
- labour productivity indexed to the national average; and
- MFP growth.

6.2.4. Other Innovation Capacity Measures

Several other measures also reflect Newfoundland and Labrador's innovative capacity and innovation-related activities, including academic and private-sector R&D, industrial structure and internet use.

Universities play a major role in creating knowledge and promoting the diffusion of new technologies and can be a valuable source of new ideas. Moreover, industries can leverage their research investments by developing close ties with major research universities. R&D expenditures in higher-education institutions allow us to see the contribution of our academic sector to provincial R&D, and hence, to our innovation capacity.



As identified in Section 6.2.1, firms involved in manufacturing and professional services are most active in those economies that have more innovative activity. They tend to be users of advanced technology and required skilled labour. As an additional measure, we will examine the share of firms in our economy that comprise these industries.

The flow of information plays an essential role in the diffusion of new technology and new ideas. As such, telecommunication is increasingly important to economic development. Telecommunication infrastructure in this province has benefited in recent years from the expansion and modernization of telephone infrastructure and broadband networks. Aside from broadband access, comparable quantitative measures of telecommunication infrastructure are limited. Consequently, the measure used relates to internet access and use.

As other innovation capacity measures, we will consider:

- total R&D expenditures in higher-education institutions;
- total R&D expenditures in higher-education institutions per capita;
- number of firms in manufacturing and professional services as a share of total firms; and
- percentage of households accessing the internet.

While each of these broad categories and their corresponding measures are necessary inputs to achieve our overarching long-term goal – a competitive innovation-driven economy – they are also important indicators of our success in establishing the right climate and culture for innovation.

Together, they allow us to measure, over the long term, the effectiveness of our Innovation Strategy and our collective success.

From INNOVATION STRATEGY To INNOVATION SYSTEM

7. From Innovation Strategy to Innovation System

The new actions contained in this Innovation Blueprint, together with the substantial initiatives and programs already in place, will create a strong foundation for the future. While sound blueprints and strong foundations are good beginnings, building our new innovation system will require substantial investments of time, energy, money and creative thinking from all our partners and stakeholders over the next several years.

The 2004 Speech from the Throne which committed to developing a comprehensive innovation strategy also observed that "The challenges confronting us did not occur overnight, and will not be solved overnight, but they will be solved progressively over time".

Solving our innovation challenges and making innovation work for us is in everyone's interest. It is in the interest of businesspeople who want to ensure the future of their enterprises, or to expand and become more profitable. It is in the interest of researchers, scientists and other creative people who want to work in an environment that supports and nurtures their skills and knowledge. It is in the interest of those who care about our culture and our natural environment because it will help us to preserve what we value and find better ways to sustain it for the future.

It is also in the interest of all parents who want their children and grandchildren to have the opportunity to live in and contribute to their home communities and province. It is in the interest of all people who use our health care system, our education system, our community services, our justice system, or our roads and other public infrastructure, because a more innovative province will be a more prosperous place to live and work.

Because it is in everyone's interest, building our innovation system is also everyone's responsibility. To be carried forward, this Strategy depends on a partnership with all of our citizens. It must draw on the strengths and unique character of all the heritages and cultures that have made our province exceptional in so many ways. Together, we can achieve exceptional results.

In summary, the following diagram illustrates how our Strategic Directions and Objectives (Chapter 4) will get these results, by building and strengthening each of the innovation fundamentals, described in Chapter 3.

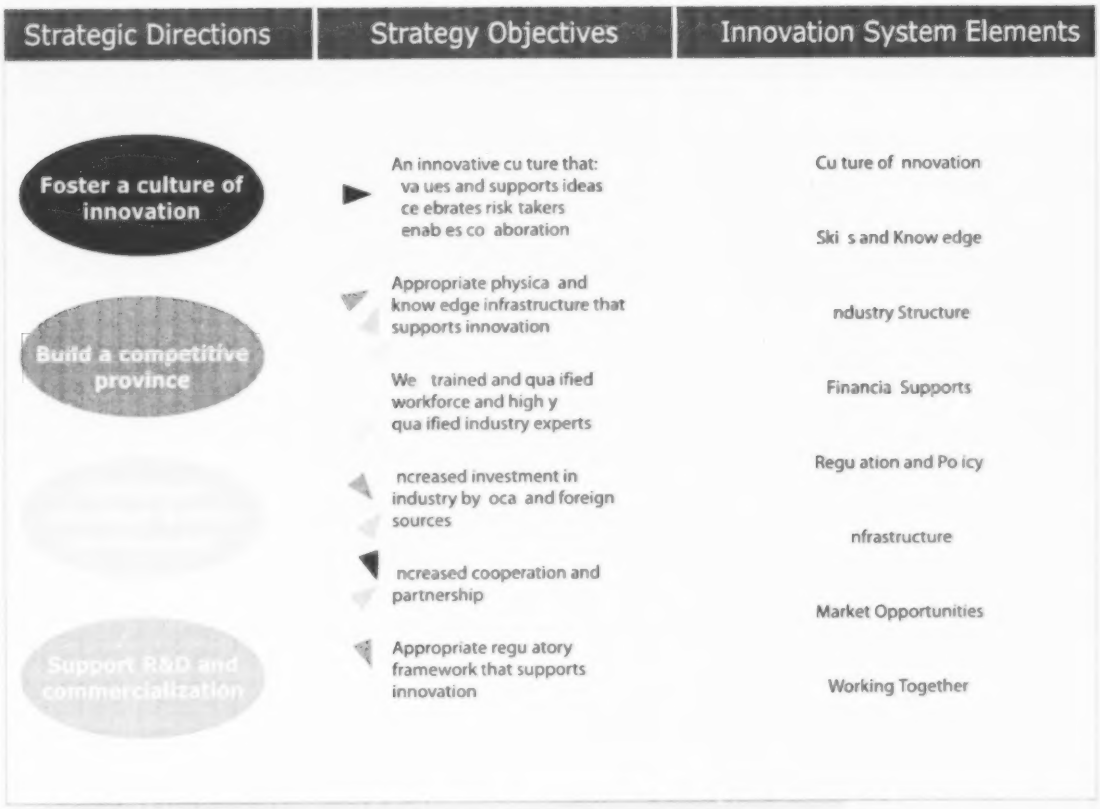

Strategic Directions
Strategy Objectives
Innovation System Elements
Foster a culture of innovation
Build a competitive province
Support R&D and commercialization
An innovative cu ture that:
va ues and supports ideas
ce ebrates risk takers
enab es co aboration
Appropriate physica and know edge infrastructure that supports innovation
We trained and qua ified workforce and high y qua ified industry experts
ncreased investment in industry by oca and foreign sources
ncreased cooperation and partnership
Appropriate regu atory framework that supports innovation
Cu ture of nnovation
Ski s and Know edge
ndustry Structure
Financia Supports
Regu ation and Po icy
nfrastructure
Market Opportunities
Working Together

Figure 7.1

These are the critical elements of our innovation system (shown in our model, Figure 3.1) and of an innovation economy: a strong culture of innovation and cooperation with the necessary skills and knowledge, the right financial supports, the supportive regulations and policies, good physical and information infrastructure, appropriate and competitive industry structures and the ability to identify and capture market opportunities for new or better goods and services.

Once these elements are in place, with our stakeholders working together, we will start to achieve the increased productivity, economic value and social gain that is the final destination of this Strategy.

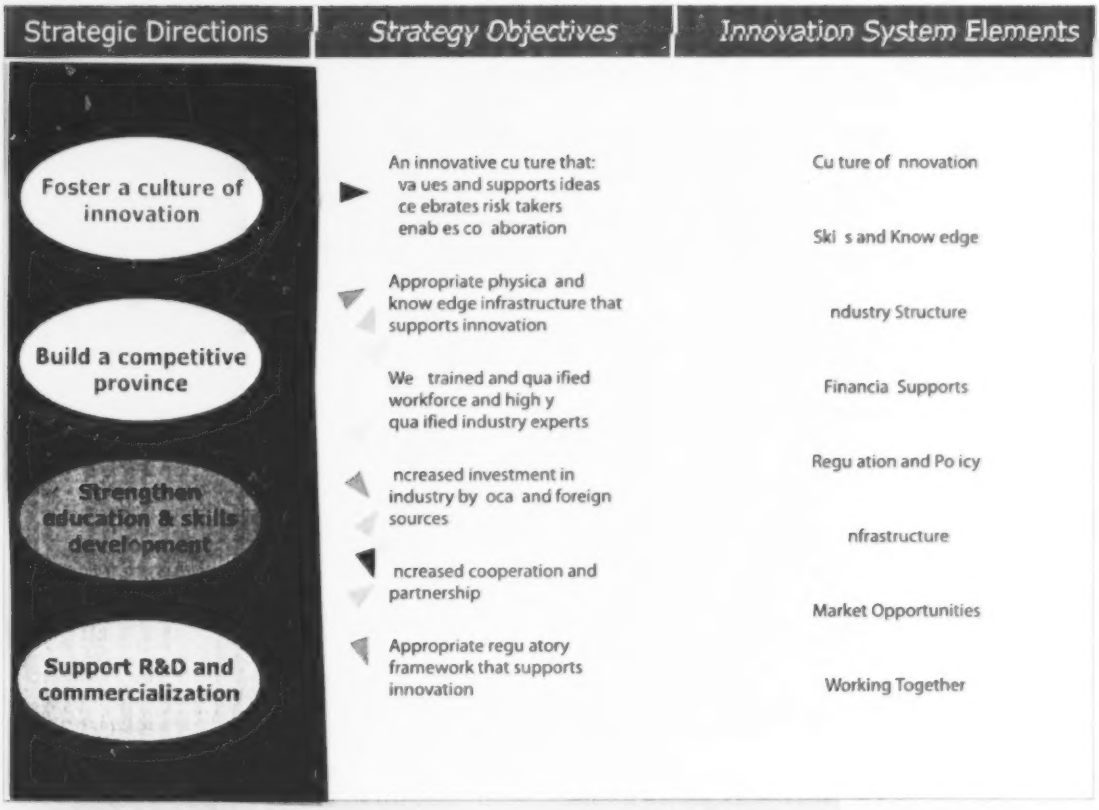

Strategic Directions
Strategy Objectives
Innovation System Elements
Foster a culture of innovation
Build a competitive province
Strengthen education & skills development
Support R&D and commercialization
An innovative cu ture that:
va ues and supports ideas
ce ebrates risk takers
enab es co aboration
Appropriate physica and know edge infrastructure that supports innovation
We trained and qua ified workforce and high y qua ified industry experts
ncreased investment in industry by oca and foreign sources
ncreased cooperation and partnership
Appropriate regu atory framework that supports innovation
Cu ture of nnovation
Ski s and Know edge
ndustry Structure
Financia Supports
Regu ation and Po icy
nfrastructure
Market Opportunities
Working Together

Figure 7.1

These are the critical elements of our innovation system (shown in our model, Figure 3.1) and of an innovation economy: a strong culture of innovation and cooperation with the necessary skills and knowledge, the right financial supports, the supportive regulations and policies, good physical and information infrastructure, appropriate and competitive industry structures and the ability to identify and capture market opportunities for new or better goods and services.

Once these elements are in place, with our stakeholders working together, we will start to achieve the increased productivity, economic value and social gain that is the final destination of this Strategy.

Newfoundland and Labrador
INNOVATION STRATEGY

APPENDIX

Appendix

Current Initiatives

The following describes initiatives now under way which complement the Innovation Strategy. These are recent initiatives, and the Innovation Strategy will help to integrate them so that they work more effectively together to create a comprehensive innovation system.

Department of Innovation, Trade and Rural Development (INTRD)

In February 2004, the Department of Industry, Trade and Rural Development became the Department of Innovation, Trade and Rural Development to reflect the enhanced emphasis placed on innovation in the provincial economic agenda. A new Assistant Deputy Minister, who also serves as the province's Chief Innovation Officer, was appointed to head up a new Innovation, Research and Advanced Technologies Branch. One of this Branch's priorities has been to lead the development of this Innovation Strategy. In addition to innovation, the department is responsible for creating and maintaining a competitive economic environment that encourages and supports private sector business growth and new long-term sustainable employment opportunities, in partnership with individuals, communities, businesses and other levels of government.

Industrial Research and Innovation Fund (IRIF)

Funding for the IRIF, identified in the White Paper on Public Post-Secondary Education, expands an initiative originally launched in September 2003. The fund was created to fill a critical void in accessing matching funds which are necessary to leverage and secure funding from other granting agencies, particularly from federal programs. Its goal is to enhance research and industrial innovation within our provincial higher education and public research institutions (Memorial University and College of the North Atlantic), as a means of fostering long-term private sector economic growth and employment creation in Newfoundland and Labrador. IRIF was begun with a one-time commitment of $5 million, which was exhausted in May 2005. The White Paper commitment (of $5 million, $7.5 million and $10 million over the next three fiscal years, starting in 2005/06) allows this important initiative to continue and to expand our participation in research and innovation opportunities.

Government's Broadband Initiative

In November 2005, the Minister of Innovation, Trade and Rural Development announced that government is reviewing all government telecommunications requirements with the intention of creating a province-wide advanced computer network. This will be a key component of this province's innovation infrastructure. Government is the biggest user of broadband services in the province and this initiative will consider ways of using its purchasing leverage to bring advanced network service to every region of Newfoundland and Labrador. This infrastructure will result in increased service for the public, community groups and businesses. An advanced network is vital for supporting innovative industries, expanding the research capabilities of our educational institutions, and allowing greater availability of such services as telehealth in remote areas.

Marine Technology Development Strategy (MTDS)

Launched in November 2004, with an initial investment of $1.5 million, INTRD is playing a lead role in implementing an aggressive marine technology development strategy for the province. The marine technology sector refers to the industry and supporting infrastructure that facilitates the use of ocean and

coastal resources by developing, producing or adding value to products and/or services, based primarily on technological and business innovation. Our existing marine sector companies have developed products and export experience, and there is an openness to develop intra-provincial and inter-provincial collaborative relationships to expand market opportunities.

The main elements of the strategy are enhancing market intelligence and marketing capabilities, enhancing commercialization capabilities, strengthening business skills, creating new companies, attracting or growing large anchor companies, facilitating access to financing and capital, filling critical skills gaps, building strategic partnerships, stimulating business growth and providing strong provincial leadership to seize opportunities in this sector.

Nearshore Atlantic

Inaugurated in December 2004, this is a public-private partnership between the Government of Newfoundland and Labrador, Aliant, and the Newfoundland and Labrador Association of Technology Industries (Nati). Nearshore Atlantic acts as a business attraction unit with a mandate to attract new technology companies to the province to conduct software-related work for international markets in such areas as engineering, design, and maintenance and support. This initiative promotes the province as a premier destination for nearshore services in global ICT service delivery, and is expected to increase the ICT sector's use of the province's technology infrastructure. Through the initiative, government, Nati and Aliant seek to foster greater collaboration between stakeholders.

Comprehensive Regional Diversification Strategy (CRDS)

This strategy, released in March 2005, is focused on identifying the priorities that must be dealt with in order to promote diversification and sustainable development throughout the province's regions, to direct government's resources so that they will have the greatest impact and benefit for the greatest number of people. One of the CRDS's guiding principles is to emphasize innovation and technology as the cornerstones for industrial development. The CRDS identifies the strategic investments needed to advance economic, social, cultural, and environmental development in each of our nine regions. These investments are through a *Regional/Sectoral* Diversification Fund (contributing to long-term sustainable employment and growth in each of the nine regions) and a Small and Medium-Sized Enterprise Fund to help finance small and medium-sized businesses. The latter fund targets strategic growth sectors such as manufacturing, value-added production, ICT and tourism, especially businesses that have export potential.

Ireland Business Partnerships (IBP)

This partnership was established in 1997 as a public/private partnership between the private sector and the Government of Newfoundland and Labrador with a mandate to identify, foster and promote trade and partnership opportunities in business, education and culture between the province and the Republic of Ireland. The IBP was strengthened in 2005 through an increased budget, incorporation within INTRD, and the appointment of a senior-level Executive Director. An IBP Advisory Board was appointed by the Premier in September 2005 to provide strategic direction and policy advice to the Partnerships, including information on the Irish economy and business, on the potential for co-operative exchanges, strategic partnerships, strategic alliances through marketing agreements, joint ventures, licensing agreements, and technology transfer on R&D initiatives. It also organizes trade and technology missions between the province and Ireland.

New England Trade and Investment Initiative

This initiative builds on Newfoundland and Labrador's historic trading relationship with the New England states. The New England Trade and Investment Team acts as an agent to help Newfoundland and Labrador companies assess their place in the New England market and encourages long-term exports to that region. The team also communicates with New England companies to educate them about the province and to encourage them to joint-venture, contract, manufacture or otherwise establish a presence in Newfoundland and Labrador. INTRD takes an innovative approach with the New England Trade and Investment Initiative by working with

Newfoundland and Labrador exporters on a business-to-business level in the New England *marketplace.*

A wide variety of strategic initiatives have taken place as a result, engaging new regions and new opportunities. In January 2006, for example, the Premier and the Governor of Rhode Island signed an MOU to strengthen the relationship between the province and the state for cooperation and partnerships in ocean and marine technology and other sectors. A Newfoundland and Labrador/Rhode Island Ocean and Marine Technology Joint Working Group will action mutually beneficial strategies focused on the sector. At the same time, MOUs were also signed between OceansAdvance of St. John's and the US Marine and Oceanographic Technology Network, and between MUN's Marine Institute and the University of Rhode Island's Graduate School of Oceanography.

Supplier Development Initiative

Launched in February 2005, the Supplier Development Initiative is a partnership of the Department of Innovation, Trade and Rural Development and Canadian Manufacturers and Exporters (CME). It is designed to strengthen the relationship and understanding between public-sector purchasing agents and private-sector groups and thereby facilitate the development of our local supplier community when bidding on government goods and services. The initiative consists of workshops held in different centres throughout the province, and includes presentations from key public sector procurement specialists from federal, provincial and local government departments and agencies.

Centre for Environmental Excellence (CEE)

A partnership among business, government and centres of higher education, the CEE was established in January 2005. The Centre's aim is to provide long-term economic and social benefits to the province. The collaborative venture aims to expand existing research and development, educational capacity and commercial activities as a means to diversify and strengthen the provincial economy. Based at Sir Wilfred Grenfell College and the College of the North Atlantic, the CEE will draw on available infrastructure, programs, services, research, development and private sector activity in the western region of the province. In particular, it will utilize the extensive expertise in the area in environmental studies, social science and technical programs. Creating a critical mass of expertise, it will serve as the primary access point for environmental studies and research, and will assist companies to improve their business processes and product lines, thus resulting in greater economic activity.

White Paper on Public Post-Secondary Education

Education and training are fundamental components of our innovation system. Released in July 2005, the White Paper forms a critical part of government's continued commitment to provide affordable and accessible post-secondary education and training opportunities throughout the province. The White Paper and its initiatives strongly emphasize the importance of the post-secondary system for the future social and economic development of the province, and for building stronger institutional links to economic development, to labour market requirements and to the regions. The White Paper also supports a vision of the province becoming an international leader in applied environmental research and development, and other innovative areas.

Office of the Chief Information Officer (OCIO)

Established in 2004, the Office is responsible for streamlining and enhancing service delivery, reforming management and operational practices throughout government and bridging the role of government in public service delivery with the private sector. Strategic improvements will be made to ICT functions that will result in a more efficient, better organized and more accessible provincial government.

The OCIO is also being given a more centralized structure to facilitate its operational role of implementing an ICT strategy across government. The Office falls under government's Executive Council, and reports directly to the Premier. In

addition, the Information Technology Management Division of Treasury Board Secretariat reports directly to the Chief Information Officer.

Department of Business

In May 2004, government established a new Department of Business, led by the Premier, to take a lead role in attracting new business and investment to the province. In collaboration with the Department of Innovation, Trade and Rural Development, it works to build a more competitive economy driven by private sector firms operating in all regions of the province. To date, key initiatives have included the establishment of the Business Advisory Board, Branding and the Red Tape Reduction initiative.

Business Advisory Board

Established in May 2005, the Board provides advice to the Department of Business to help government identify challenges and optimize opportunities for the province's business community. Composed of representatives from various industries and regions of the province, it provides expert advice about economic trends and conditions and about the future possibilities for our economy, including innovative initiatives and opportunities.

Branding

Innovation is not only about new products and services. It is also about finding new ways to make the enterprise system work for us – about new ways of getting to market and about new markets, even for "old" products. Marketing also includes promoting Newfoundland and Labrador to innovative enterprises and industries as a good place to set up operations, to live and to do business. To help address these needs, the province is in the process of developing a new branding campaign to highlight our strengths and competitive advantages for business, including our capacity to support innovation.

Red Tape Reduction (RTR) Task Force

This initiative, announced in August 2005, is eliminating, throughout government, unnecessary bureaucratic and regulatory hurdles ("red tape") which might hinder economic development or investment in the province, or otherwise delay or diminish the services government provides to citizens. Its immediate goal is to reduce regulatory requirements by 25 per cent over three years, thus providing more efficient access to services and programs. Red tape can include legislation, regulations, permits, licenses, paperwork, filing and certification requirements, inspections, and procedures affecting job creation and business growth. From the perspective of the Innovation Strategy, red tape can interfere with attracting new enterprises and entrepreneurs, the growth of existing enterprises, the adoption of innovative technologies and our ability to compete in the global marketplace.

Rural Secretariat

The Rural Secretariat, created in 2004, is the focal point for partnership and collaboration on issues of importance to rural Newfoundland and Labrador. It facilitates regional input into policy development and decision making, promotes improved cross-departmental analysis, and improved cross-departmental decision making in relation to rural policy. A partnership approach to regional development is essential if all regions of the province are to maximize their opportunities and enhance their long-term sustainability. Governments and communities must come together and share responsibility to develop a common vision, build on regional strengths and identify solutions for regional challenges.

The Rural Secretariat encourages and provides a forum for more effective communication among partners within each region of the province, among regions, and with and among government departments. This is accomplished, in large part, through the Provincial Council and nine Regional Councils of the Rural Secretariat. These Councils, which are composed of community leaders with economic, social, environmental and cultural backgrounds, act as advisory bodies to government. They help ensure a regional perspective in policy and decision making. These councils are leading the development of a shared vision, identifying regional policy and program priorities and communicating these priorities to Cabinet and to all citizens in the province.

Immigration Policy

Attracting highly-qualified individuals and those with new ideas from around the world can help us become more innovative and better able to compete in the global marketplace. In June 2005, the Minister of Human Resources, Labour and Employment released a discussion paper, *Opportunity for Growth*. It explores immigration as a resource for revitalizing some areas of the province and some industries. This is based on the knowledge – and our own experience in this

province – that immigrants can offer new ideas, new cultural experiences and specialized skills, and establish successful business ventures that employ local residents. Beginning in September 2005, consultations were held with other key stakeholders throughout the province and in each of the nine regions of the Rural Secretariat. The Provincial Nominee Program (PNP) recruits immigrants who have specialized occupational or entrepreneurial skills to contribute to the economic and social development of the province.

Energy Plan

In November 2005, Government commenced a process to develop a comprehensive and long-term Energy Plan with the release of a public discussion paper. The Energy Plan will provide a framework of the major policies and directions to guide Government's management of the energy sector. R&D, education and training will be important components of the Energy Plan process. An extensive public consultation process is currently underway, including public meetings across Newfoundland and Labrador.

Northern Strategic Plan

Government has commissioned the Department of Labrador and Aboriginal Affairs to develop a Northern Strategic Plan that addresses Labrador's social and economic needs, removes barriers to development and builds on Labrador's tremendous growth potential. The Plan will focus on such areas as natural resources, tourism and culture, transportation, health care and education. It will support Government's commitment to the development of Labrador for the benefit of all Labradorians, setting out government's priorities for the region and defining the requirements for a stable and self-sustaining economy.

Strategic Cultural Plan

To nurture our cultural strengths, government is developing a Strategic Cultural Plan to promote our heritage, celebrate our identity and champion creativity. The province is in a period of transition and it is important to protect our at-risk languages, customs, traditional practices and heritage, as well as increase investment in culture overall, especially in artists and the creative process. In this way, we can stimulate cultural production, create more jobs, capitalize on our export potential and take advantage of the new technologies that make our culture more accessible at home and abroad. All levels of government and the private sector will be encouraged to invest in the cultural sector and its capacity for creative innovation.

Strategic Partnership Initiative (SPI)

This is a mechanism to improve communications and identify opportunities for collaboration among business, labour and government on the strategic economic challenges facing the province. It provides an opportunity for government to engage with business and labour in discussions of a strategic nature on critical issues. Members include the Deputy Ministers of INTRD, Finance and the Labour Relations Agencies as well as representatives of the Newfoundland and Labrador Federation of Labour and the Newfoundland and Labrador Business Caucus. A Secretariat provides organizational and analytical support to the partnership and helps build capacity for implementing the partnerships in government, business and labour organizations. Established in 2002, the SPI has been strengthened in recent years to undertake major work on competitiveness and has established sub-committees to work on four key issues: labour market development, investment capital, taxation and industrial relations.

The Women's Policy Office

The 2005 Throne Speech committed to integrating women's voices and perspectives when formulating public policies; enhancing the use of gender-based analysis; introducing special measures to ensure women share equitably in the social and economic benefits of the province and advancing women in leadership.

Infrastructure Strategy

Announced in 2004, government has embarked upon the development of a comprehensive multi-year infrastructure strategy which will target key investments in our major infrastructure sectors including health, education, transportation, justice, public buildings and municipal infrastructure. The objective is to develop a five-year plan for strategic investments which will also inform the construction industry of the expected level of capital investment so that it can adjust its capacity levels accordingly. The strategy is scheduled for completion within the next few months.

Municipal Rural Infrastructure Fund

In November 2005, the Government of Newfoundland and Labrador and the Government of Canada announced the signing of the Canada-Newfoundland and Labrador Municipal Rural Infrastructure Fund Agreement. This agreement will result in an investment of up to $84 million for infrastructure in Newfoundland and Labrador communities, with contributions from federal, provincial and local governments. At least 60 per cent of the funding under the Agreement will go to "green" projects that improve the quality of the environment and contribute to cleaner air, soil and water. These include water, waste water, solid waste, public transit and environmental energy improvements. Other eligible projects include local roads, cultural, recreational and tourism infrastructure, and broadband connectivity.

Climate Change Action Plan

Climate change initiatives present significant opportunities for the environmental industry and, with planning, can stimulate economic growth and improve the productivity and efficiency of the province's industrial sector. Investment in climate change research will provide opportunities to develop and grow local business and will also result in new, more efficient infrastructure and industrial facilities. The plan will complement many of government's ongoing policy objectives and the province's commitment to sustainable development.

Sustainable Development Act

In keeping with its Blueprint commitment, government is developing a Sustainable Development Act to ensure the responsible and sustainable development of our natural environment. The Act will recognize the full range of uses and values of our natural resources, including resource industries, habitat for wildlife, parks and wilderness, tourism and recreation, and safeguarding our air, water, soil and ecosystems. It will also focus development of our non-renewable resources to benefit future as well as present generations. The legislation will ensure that our resource decisions address the full range of environmental, social and economic values, and that workers, environmentalists, industry, communities, aboriginal peoples and others have a say in how our resources are managed. This is a necessary foundation for the province's long-term economic growth.

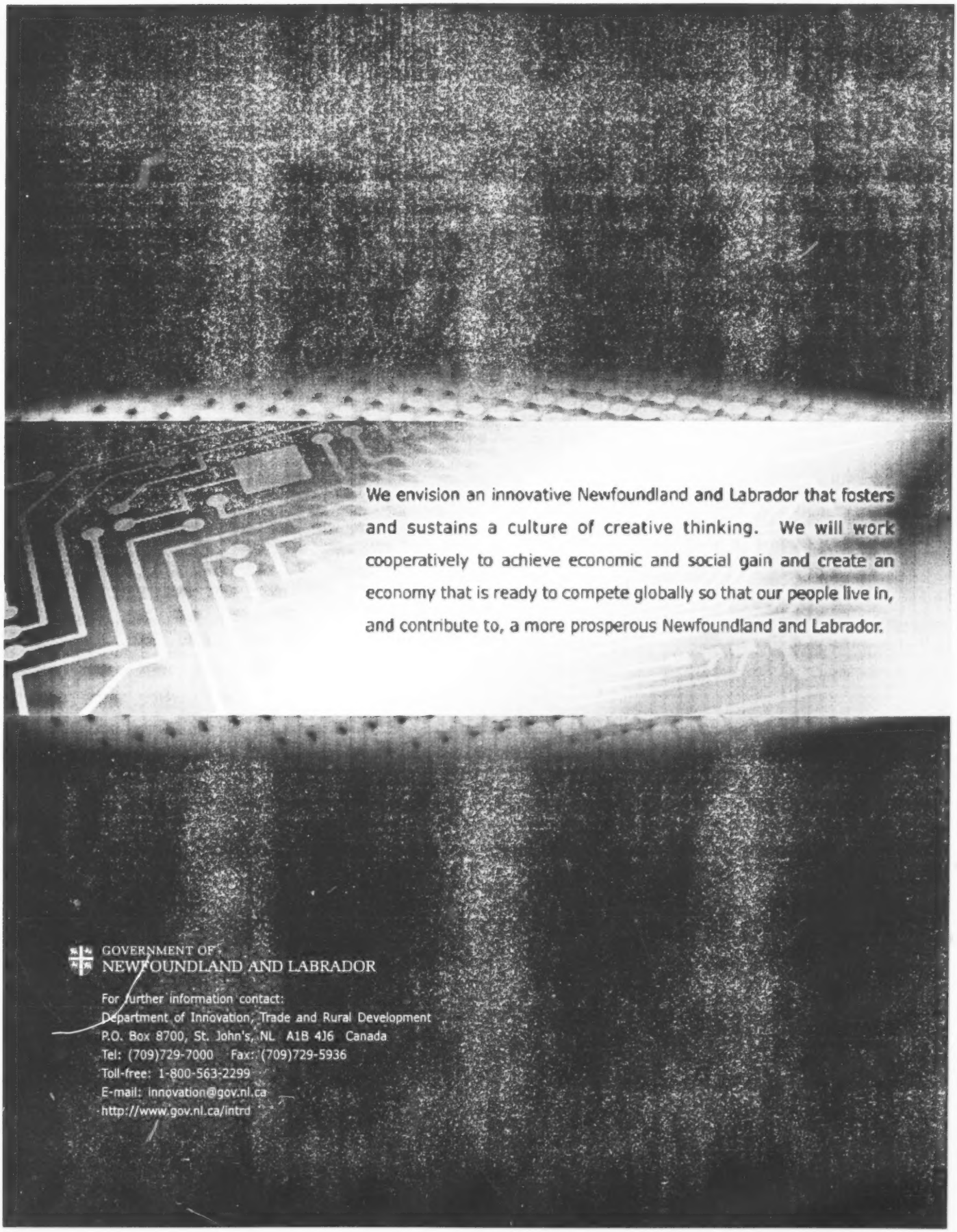
Integrated Provincial Development Plan

In January 2006, government announced the establishment of a top-level process to ensure that our various provincial development strategies and initiatives are being carried out in an integrated, coordinated fashion, in line with government's goals. This initiative will examine these strategies, identify any gaps and areas that need further attention, and make a determination about the appropriateness and effectiveness of the approach for meeting Newfoundland and Labrador's needs.

Acronyms

ACEnet	Atlantic Computational Excellence Network
ACOA	Atlantic Canada Opportunities Agency
ADIANL	Aerospace and Defense Industry Association of Newfoundland and Labrador
AIF	Atlantic Innovation Fund
BDC	Business Development Bank of Canada
BR&E	Business Retention and Expansion
BRAND	Broadband for Rural and Northern Development
CBDC	Community Business Development Corporation
CCFI	Canadian Centre for Fisheries Innovation
CCMC	Canadian Centre for Marine Communications
CDLI	Centre for Distance Learning and Innovation
CEE	Centre for Environmental Excellence
CFI	Canada Foundation for Innovation
CFIB	Canadian Federation of Independent Business
CIC	Campus Incubation Continuum
CIHR	Canadian Institutes of Health Research
CME	Canadian Manufacturers & Exporters
CNA	College of the North Atlantic
CNG	Compressed Natural Gas
CRDS	Comprehensive Regional Diversification Strategy
CREAIT	Core Research Equipment and Instrument Training Network
CSLV	Computing, Simulation and Landmark Visualization
CVC	Computation and Visualization Centre
DELT	Distance Education and Learning Technologies
EDGE	Economic Diversification and Growth Enterprises
GMIST	Gros Morne Institute for Sustainable Tourism
GMO	Getting the Message Out
HPC	High Performance Computing
HQP	Highly-Qualified People
IBP	Ireland Business Partnerships
ICT	Information and Communications Technologies
IIC	INCO Innovation Centre
INTRD	Department of Innovation, Trade and Rural Development
IOCC	Iron Ore Company of Canada
IP	Intellectual Property
IRIF	Industrial Research and Innovation Fund
LSVCC	Labour-Sponsored Venture Capital Corporation
M&E	Machinery and Equipment
MFP	Multi-Factor Productivity
MI	Marine Institute
MOU	Memorandum of Understanding

MTDS	Marine Technology Development Strategy
MUN	Memorial University of Newfoundland
NAIA	Newfoundland Aquaculture Industry Association
NAICS	North American Industry Classification System
Nati	Newfoundland and Labrador Association of Technology Industries
NEIA	Newfoundland and Labrador Environmental Industry Association
NLCHI	Newfoundland and Labrador Centre for Health Information
NLFL	Newfoundland and Labrador Federation of Labour
NLOWE	Newfoundland and Labrador Organization of Women Entrepreneurs
NLREDA	Newfoundland and Labrador Regional Economic Development Association
NLTA	Newfoundland and Labrador Teachers' Association
NOIA	Newfoundland Ocean Industries Association
NRC	National Research Council
NRC-CISTI	National Research Council - Canada Institute for Scientific and Technical Information
NRC-IOT	National Research Council - Institute for Ocean Technology
NRC-IRAP	National Research Council - Industrial Research Assistance Program
NSERC	Natural Sciences and Engineering Research Council of Canada
OCIO	Office of the Chief Information Officer
OLIN	Open Learning Information Network
PACE	Program of Achievement in Community Enterprise
PNP	Provincial Nominee Program
PRAC	Petroleum Research Atlantic Canada
R&D	Research and Development
REDB	Regional Economic Development Board
RTR	Red Tape Reduction
SMEs	Small and Medium-Sized Enterprises
SPI	Strategic Partnership Initiative
SR&ED	Scientific Research and Experimental Development
SSHRC	Social Sciences and Humanities Research Council of Canada
TCA	Team Canada Atlantic
TETRA	Telehealth and Education Technology Resource Agency
UNCTD	United Nations Conference on Trade and Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
VC	Venture Capital



We envision an innovative Newfoundland and Labrador that fosters and sustains a culture of creative thinking. We will work cooperatively to achieve economic and social gain and create an economy that is ready to compete globally so that our people live in, and contribute to, a more prosperous Newfoundland and Labrador.

GOVERNMENT OF
NEWFOUNDLAND AND LABRADOR

For further information contact:
Department of Innovation, Trade and Rural Development
P.O. Box 8700, St. John's, NL A1B 4J6 Canada
Tel: (709)729-7000 Fax: (709)729-5936
Toll-free: 1-800-563-2299
E-mail: innovation@gov.nl.ca
http://www.gov.nl.ca/intrd